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SECTION 01000

GENERAL CONTRACT REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

19 CFR 24.24	Harbor Maintenance Fee
33 CFR 156	Oil and Hazardous Material Transfer Operations

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual
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1.2 PARTNERING

The Government encourages formation of informal project partnerships on all projects. A project partnership strives to utilize a cooperative working relationship to jointly establish and effectively reach mutual project execution goals. The partnering process will in no way relax nor stiffen the requirements of the contract, but enhance the likelihood of success through improved working relationships. The possibility of an informal partnership may be discussed at the Pre-construction Conference for this project.

1.3 RIGHTS-OF-WAY

a. The rights-of-way for the work to be constructed under this contract, within the limits indicated on the drawings, will be provided by the Government without cost to the Contractor. If these rights-of-way are used by the Contractor, he shall, at his own expense, do all work necessary to make such rights-of-way suitable for traveling to and from the worksite. Upon completion of the Contractor's work, any such rights-of-way furnished by the Government shall be left in a condition satisfactory to the Contracting Officer.

b. When so directed by the Contracting Officer, the Contractor shall, without expense to the Government and at any time during the progress of the work when it is not being actively used for contract operations, promptly vacate and clean up any part of the Government grounds or rights-of-way that have been allotted to or have been in use by the Contractor.

c. The Contractor shall not obstruct any existing roads on lands controlled by the United States except with written permission of the Contracting Officer and shall maintain such roads in as good condition

as exists at the time of commencement of work under this contract.

d. The Contractor shall procure, without expense to the Government, all additional lands, access roads, or rights-of-way necessary for his use in the performance of the work or as required by his method of operation. The Contractor shall submit written evidence to the Contracting Officer that he has obtained the rights-of-way from the property owners. The written evidence shall consist of an authenticated copy of the conveyance under which the Contractor acquired such rights-of-way, prepared and executed in accordance with the laws of the State in which the land is located. The Contractor shall also obtain from the owners a release for the Government for any damages which may result from his use of such rights-of-way. The written conveyance and release shall be provided to the Government prior to use of Contractor obtained additional lands, access roads, or rights-of-way. If temporary rights-of-way are obtained by the Contractor the period of time for those rights shall coincide with Section 00800 SPECIAL CONTRACT REQUIREMENTS, paragraph COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK, plus a reasonable time for any extension granted for the completion of the work. Any agreements or permits with levee boards, counties, parishes, municipalities, or other political subdivisions for moving material and equipment will be the responsibility of the Contractor and will be obtained at no expense to the Government. Any delays to the Contractor resulting from delays in procuring such additional lands, access roads, rights-of-way, or permits for moving material and equipment for his work under this contract will not be a basis for any claim for increase in the cost of this contract. The Contractor shall make his own investigations to determine the conditions, restrictions and difficulties which may be encountered in acquiring such rights-of-way and in the transportation of material and equipment. In addition, the Contractor shall be solely liable for any and all damages and claims of any nature whatsoever arising from or growing out of the acquisition and use of rights-of-way, etc. other than those furnished by the Government.

e. Notwithstanding any language or drawings to the contrary in this contract, the United States will not provide access or rights-of-way over any public lands and will not be responsible for acquiring such.

f. The Contractor shall repair at no expense to the Government, any and all damage to any existing roads when such damage is a result of his operations under this contract. (CEMVK-OC, 1989)

1.4 PRECONSTRUCTION CONFERENCE

a. A preconstruction conference will be arranged by the Area Engineer as soon after contract award as possible, and the conference will be conducted before work is allowed to commence. The Area Engineer will notify the Contractor of the time, date, and location for the meeting. At this conference, the Contractor will be oriented with respect to contract administration procedures, lines of authority, and construction matters. All known subcontractors performing at least 20 percent of the contract are required to attend this conference. Additional conferences may be established by the Area Engineer for any major subcontractors unknown at the time of the initial conference.

b. Submission by the Contractor of the items listed below will determine the date of the conference. The following items shall be submitted to the Area Engineer for review at least seven (7) calendar

days prior to the preconstruction conference:

- (1) Accident Prevention Plan
- (2) Environmental Protection Plan
- (3) Quality Control Plan

c. The Contractor shall bring to this conference, in completed form the following:

- (1) Letter of superintendent appointment and authority
- (2) List of subcontractors

d. The Contractor should bring to this conference, or at least be prepared to discuss, the following:

- (1) Submittal register
- (2) Progress chart or Network Analysis System (as applicable)

e. Minutes of this conference will be taken and prepared by the Area Engineer and sent to the Contractor for his concurrence and signature.

1.5 NOTIFICATION OF AREA ENGINEER BEFORE BEGINNING WORK

At least 7 days before beginning work and at least one day before resuming work after a period of 7 days or more when no work has been performed, the Contractor shall notify Mr. Gordon O. Inman, Area Engineer, Greenwood Area Office, P.O. Box 946, Greenwood, Mississippi 38935-0946, Telephone (601) 453-5531.

1.6 ORDER OF WORK

The work shall be carried on in accordance with the Progress Chart (schedule) required by paragraph (a) of the Contract Clause SCHEDULES FOR CONSTRUCTION CONTRACTS. In preparing the Progress Chart (schedule), the Contractor shall give the following priorities to work:

Construction shall be limited to no more than three structure sites at any given time. When work at any one site is substantially complete, then work on another site may begin. For this purpose, work at a site will be considered substantially complete when all work at the site except reforestation and erosion control has been completed and accepted by the Government. Any proposed variance from this order of work must be approved by the Contracting Officer in writing.

1.7 PROGRESS CHART

The progress chart required by provisions of paragraph (a) of the Contract Clause SCHEDULES FOR CONSTRUCTION CONTRACTS shall be prepared on ENG FORM 2454, copies of which will be furnished to the Contractor by the Government. SIX (6) COPIES OF THE SCHEDULE WILL BE REQUIRED.

1.8 DESIGNATED BILLING OFFICE

The designated billing office for this contract shall be U.S. Army Corps of Engineers, Greenwood Area Office, P.O. Box 946, Greenwood, Mississippi

38935-0946.

1.9 PAYMENT INVOICES

a. The Federal Acquisition Regulation requires that the "REMIT TO" address on the invoice match the "REMIT TO" address on the contract or a proper notice of assignment. The Payment Office will verify a match of the "REMIT TO" address in the contract and Contractor's invoice prior to payment. If the addresses do not match, the invoice will be determined improper and returned to the Contractor for correction and resubmission. If an invoice is improperly returned, the original invoice receipt date shall be used as the basis for determining interest to be paid in accordance with the PROMPT PAYMENT ACT.

b. Among other things, the Contract Clause PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS requires that a proper invoice for payment include substantiation of the amounts requested. As required in Office of Management and Budget, Circular A-125 (Rev.), PROMPT PAYMENT, dated December 12, 1989, substantiation of the amount requested for progress payments under construction contracts includes the following:

- (1) An itemization of the amounts requested related to the various elements of work required by the contract covered by the payment request;
- (2) A listing of the amount included for work performed by each subcontractor under the contract;
- (3) A listing of the total amount of each subcontract under the contract;
- (4) A listing of the amounts previously paid to each such subcontractor under the contract; and,
- (5) Additional supporting data in a form and detail required by the contracting officer.

c. Failure to include the above information in a Contractor's invoice will result in the invoice being considered defective under the provisions of the PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS clause of the contract, and it will be returned to the Contractor for correction and resubmission. (CEMVK-OC, 1997)

1.10 TEMPORARY PROJECT FENCING

Temporary project fencing as required by Section 4, "Temporary Facilities", paragraph 04.A.04 of EM 385-1-1, "Safety and Health Requirements Manual", dated 3 September 1996, is not required on this project.

1.11 PROJECT SIGN (APR 1991)

The Contractor shall fabricate, erect and maintain one sign for project identification. The sign shall be displayed and positioned for reading by passing viewers. The exact location is subject to Contracting Officer's approval. Information for the right side of the project sign shall be as follows:

Title: RISER PIPE GRADE CONTROL STRUCTURES

RP-98-03

Project: FC/MR&T, YAZOO BASIN
HICKAHALA CREEK WATERSHED, TATE COUNTY, MS
DEMONSTRATION EROSION CONTROL PROJECT

Contract No: DACW38-00-C-0XXX

Contractor: (Contractor's name and city)

The project identification sign shall meet the requirements specified in the U.S. Army Corps of Engineers Sign (USACES) Standards Manual, EP 310-1-6a and EP 310-1-6b. A copy of the sign standards manual is available for review at the office of the Vicksburg District Sign Program Manager and questions concerning manufacture and installation of the project identification sign may be addressed to:

Vicksburg District Sign Program Manager (Lawran Richter)
ATTN: CEMVK-OD-MN
4155 Clay Street
Vicksburg, MS 39183-3435
Telephone: (601) 631-5287

1.12 MINIMUM REQUIRED INSURANCE

The following paragraph is applicable if the services involved are performed on a Government Installation. Government Installation is defined as property where the Government holds by fee simple title, by construction rights-of-way, or perpetual easement, etc., an interest in real property. See Contract Clause INSURANCE-WORK ON A GOVERNMENT INSTALLATION.

a. Workmen's Compensation and Employer's Liability Insurance. The Contractor shall comply with all applicable workmen's compensation Statutes of the State of Mississippi and shall furnish evidence of Employer's Liability Insurance in an amount of not less than \$100,000.

b. General Liability Insurance. Bodily injury liability insurance in the minimum limits of \$500,000 per occurrence on the comprehensive form of policy.

c. Automobile Liability Insurance. Minimum limits of \$200,000 per person and \$500,000 per occurrence for bodily injury and \$20,000 per occurrence for property damage. This insurance shall be on the comprehensive form of policy and shall cover the operation of all automobiles used in performance of the contract.

1.13 WORK IN QUARANTINED AREA

The work called for by this contract involves activities in counties quarantined by the Department of Agriculture to prevent the spread of certain plant pests which may be present in the soil. The Contractor agrees that all construction equipment and tools to be moved from such counties shall be thoroughly cleaned of all soil residues at the construction site with water under pressure and that hand tools shall be thoroughly cleaned by brushing or other means to remove all soil. In addition, if this contract involves the identification, shipping, storage, testing, or disposal of soils from such quarantined area, the Contractor agrees to comply with the provisions of ER 1110-1-5, "Plant Pest Quarantined Areas and Foreign Soil Samples" attachments, a copy of which

will be made available by the Contracting Officer upon request. The Contractor agrees to assure compliance with this obligation by all subcontractors.

1.14 CERTIFICATES OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of material with specification requirements shall be executed in accordance with Section 01330 SUBMITTAL PROCEDURES. Each certificate shall be signed by an official authorized to certify on behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

1.15 SAFETY

This contract is subject to the requirements of EM 385-1-1, "U.S. Army Corps of Engineers Safety and Health Requirements Manual", dated 3 September 1996. No separate payment will be made for compliance with the requirements thereof.

1.16 SAFETY SIGN

The Contractor shall fabricate, erect and maintain a safety sign at the site, as located by the Contracting Officer. The sign shall be erected as soon as practicable, but not later than 15 calendar days after the date established for commencement of work. The data required shall be current. The safety sign shall meet the requirements specified in the U.S. Army Corps of Engineers Sign (USACES) Standards Manual, EP 310-1-6a and EP 310-1-6b. A copy of the sign standards manual is available for review at the office of the Vicksburg District Sign Program Manager and questions concerning manufacture and installation of the safety sign may be addressed to:

Vicksburg District Sign Program Manager (Lawran Richter)
ATTN: CEMVK-OD-MN
4155 Clay Street
Vicksburg, MS 39183-3435
Telephone: (601) 631-5287

1.17 ACCIDENT PREVENTION PLAN

Refer to Contract Clause ACCIDENT PREVENTION (Alternate I). Within 15 days after receipt of award of the contract, an Accident Prevention Plan shall be submitted to the Contracting Officer for review and acceptance. The plan shall be prepared in the following format:

a. An executed LMV FORM 358-R, "Administrative Plan" (available upon request), see Appendix A, "Minimum Basic Outline for Accident Prevention Plan" of EM 385-1-1.

b. An executed LMV FORM 359-R, "Activity Hazard Analysis" (available upon request), see paragraph 01.A.09 and figure 1-1 of EM 385-1-1.

- c. A copy of company policy statement regarding accident prevention.
- d. When marine plant and equipment are in use under a contract, the method of fuel oil transfer shall be submitted on LMV Form 414R Fuel Oil Transfer, (available upon request). (Refer to 33 CFR 156.)
- e. The Contractor shall not commence physical work at the site until the plan has been accepted by the Contracting Officer, or his authorized representative. At the Contracting Officer's discretion, the Contractor may submit his Activity Hazard Analysis only for the first phase of construction provided that it is accompanied by an outline of the remaining phases of construction. All remaining phases shall be submitted and accepted prior to the beginning of work in each phase. Also, refer to Section 1, "Program Management", paragraph 01.B, "Indoctrination and Training" of EM 385-1-1.

1.18 DAILY INSPECTIONS

Refer to Contract Clause INSPECTION OF CONSTRUCTION. The Contractor shall perform daily safety inspections and record them on the forms approved by the Contracting Officer. Reports of daily inspections shall be maintained at the job site. The reports shall be records of the daily inspections and resulting actions. As a minimum each report shall include the following:

- a. Phase(s) of construction underway during the inspection
- b. Locations or areas inspections were made.
- c. Results of inspection, including nature of deficiencies observed and corrective actions taken, or to be taken, date, and signature of the person responsible for its contents.

1.19 ACCIDENT INVESTIGATIONS AND REPORTING

Refer to EM 385-1-1, Section 1, "Program Management", paragraph 01.D, "Accident Reporting and Recordkeeping". Accidents shall be investigated and reports completed by the immediate supervisor of the employee(s) involved and reported in writing to the Contracting Officer or his representative within one working day after the accident occurs.

1.20 ACCOMMODATIONS FOR GOVERNMENT REPRESENTATIVES

- a. Accommodations. The Contractor shall furnish and maintain a temporary building for the exclusive use of the Government Representatives and shall move the building from the vicinity of one part of the work to another as the work progresses. The building shall be of light, but weatherproof construction, approximately 11.1 square meters in size with not less than 2.1 meters of headroom. It shall have a substantial workbench along one side and sufficient number of windows to admit ample working light. Windows shall be arranged to open and to be securely fastened from the inside. The door shall be of wood panel or solid core construction and be equipped with a padlock and heavy duty hasp bolted to the door. Insect screens shall be provided for windows. Glass panels in windows shall be equipped with bars or heavy mesh screens which will prevent easy access to the building through these panels. The Contractor shall heat the building by means of heaters and shall cool the building by means of an air conditioning unit. Electric current shall also be provided for operation of lights, appliances, and electric calculators at 115 volts

AC. Electric current may be provided by use of a portable generator. A minimum of two wall outlets and two ceiling drops shall be provided in the building. One office desk and a minimum of two chairs shall be provided in the building. Telephone service with an exclusive line solely for Government use shall be furnished to the Government Representative building. Toilet facilities shall be provided in the building or adjacent thereto. The building shall remain the property of the Contractor and upon completion of all work under the contract shall be removed as provided in the Contract Clause OPERATIONS AND STORAGE AREAS. An office trailer meeting the above requirements will be acceptable.

b. Janitor Services. The Contractor shall furnish daily janitorial services for the above offices and perform any required maintenance of subject facility and adjacent grounds during the entire life of the contract. Toilet facilities shall be clean and sanitary at all times. Services shall be performed at such a time and in such a manner to least interfere with the operations but will be accomplished only when the facility is in daily use. The Contractor shall also provide daily trash collection and cleanup of the building and adjacent outside areas, and shall dispose of all discarded debris in a manner approved.

c. Should the Contractor refuse, neglect, or delay compliance with the above requirements, the specific facilities may be furnished and maintained by the Contracting Officer, and the cost thereof will be deducted from any amount due or to become due the Contractor.

1.21 MACHINERY AND MECHANIZED EQUIPMENT

Machinery and mechanized equipment used under this contract shall comply with the following:

a. When mechanized equipment is operated on floating plant, the Contractor shall provide positive and acceptable means of preventing this equipment from moving or falling into the water. The type of equipment addressed by this clause includes front-end loaders, bulldozers, trucks (both on- and off-road), backhoes, hydraulic excavators (track hoes), and similar equipment. If the Contractor plans to use such equipment on floating plant, an activity hazard analysis must be developed for this feature of work. The plan must include a detailed explanation of the type or types of physical barriers, curbs, structures, etc., which will be incorporated to protect the operator and prevent the equipment from entering the water. Nonstructural warning devices may be considered for situations where the use of structural barriers is determined to be impracticable. The activity hazard analysis must thoroughly address the procedure and be submitted to the Corps for review and acceptance prior to start of this feature of work.

b. The stability of crawler, truck, and wheel-mounted cranes shall be assured.

(1) The manufacturer's load-rating chart may be used to determine the maximum allowable working load for each particular crane's boom angle provided a test load, with a boom angle of 0.35 rads, confirms the manufacturer's load-rating table.

(2) Stability tests are required if:

(i) there is no manufacturer's load-rating chart securely fixed to the operator's cab;

(ii) there has been a change in boom or other structural member or,

(iii) there has been a change in the counterweight. The test shall consist of lifting a load with the boom in the least stable undercarriage position and at an angle of 0.35 rads above the horizontal. The test shall be conducted under close supervision on a firm, level surface. The load that tilts the machine shall be identified as the test load. The test load moment (N-m) shall then be calculated by multiplying the horizontal distance (in meters) from the center of rotation of the machine to the test load, times the test load (in N). Three-fourths of this test-load moment shall then be used to compute the maximum allowable operating loads for the boom at 0.35, 0.70, 1.05 and 1.40 rads above horizontal. From these maximum allowable operating loads, curve shall be plotted and posted in the cab of the machine in sight of the operator. These values shall not be exceeded except in the performance test described below. The test load shall never exceed 100 percent of the manufacturer's maximum rated capacity.

(3) In lieu of the test and computations above, the crane may be load tested for stability at each of the four boom positions listed above.

c. Performance tests shall be performed in accordance with Section 16, "Machinery and Mechanized Equipment" of EM 385-1-1, "Safety and Health Requirements Manual", except as specified below. Performance tests shall be conducted after each stability test, when the crane is placed in service on a project, and at least every 12 months.

(1) When conducting a performance load test which is required of a new crane or a crane in which load sustaining parts have been altered, replaced, or repaired (excluding replacement of the rope), the test load shall be as specified in ASME/ANSI B30 Series. That is, for overhead, gantry, portal, pillar, tower, monorail, and underhung cranes, the test load shall not exceed 125 percent of the manufacturer's load rating capacity chart at the configuration of the test; and for hammerhead tower, mobile, and floating cranes and boom trucks, the test load shall not exceed 110 percent of the manufacturer's load rating capacity chart at the configuration of the test.

(2) When conducting a performance load test which is required because a crane is reconfigured, or reassembled after disassembly, or because the crane requires an annual load test, the test loads shall not exceed 100 percent of the manufacturer's load rating capacity chart at the configuration of the test.

(3) All load tests are required to be conducted in accordance with the manufacturer's recommendations.

d. Inspections shall be made which will ensure a safe and economical operation of both cranes and draglines with inspection documented. Copies of the inspections and tests shall be available at the job site for review. All stability and performance tests on cranes and all

complete dragline inspections shall be witnessed by the Contracting Officer or his authorized representative.

e. A complete dragline inspection shall be made:

- (1) at least annually;
- (2) prior to the dragline being placed in operation; and
- (3) after the dragline has been out of service for more than 6 months.

f. All heavy equipment moved onto the worksite shall be inspected for compliance with this contract. Some LMV Inspection forms are attached at the end of this section. All completed forms, including abatement schedule of any violations, shall be maintained at the job site for continued review and update as needed.

1.22 VEHICLE WEIGHT LIMITATIONS

Vehicle weight limitations for operation on rural roads and bridges may affect the prosecution of work in this contract. The Contractor will be responsible for obtaining all necessary licenses and permits in accordance with the Contract Clause PERMITS AND RESPONSIBILITIES. Current information regarding road and bridge weight limits may be obtained by contacting the Mississippi Department of Transportation and the president of the county Board of Supervisors for the counties through which equipment and materials will be transported as a result of this contract.

1.23 PUBLIC UTILITIES

a. The locations, if any, shown on the contract drawings for public utilities are approximate only. The exact locations of such facilities shall be determined in the field by the Contractor prior to commencing construction operations.

b. Prior to performing work in the proximity of any utility, the Contractor shall contact the utility owner.

c. The Contractor's attention is directed to the possibility that he may encounter public utilities within the project limits which may be buried and the existence of which are not presently known. Should any such utilities be encountered, the Contractor shall immediately notify the Contracting Officer, or his field representative, for a determination of whether the utilities shall be removed, relocated or altered.

d. Unless otherwise noted or determined, the Contractor shall make his own arrangements with the owners of public utilities for relocating or altering utility facilities as may be necessary to permit construction of the work under this contract. The Contractor shall also be responsible for the replacement, if necessary, of the facilities to their permanent location after the completion of the construction work. An equitable adjustment to this contract for necessary utility relocation or alteration activities will be made in accordance with the Contract Clause CHANGES. However, prior to the implementation of any such relocation or alteration activities, the Contractor shall obtain the approval of the Contracting Officer or his field representative.

e. In the event the Contracting Officer chooses to arrange for such removals, relocations or alterations to be done by others, the Contractor shall cooperate fully in accordance with the Contract Clause OTHER CONTRACTS.

1.24 DAMAGE TO WORK

a. The responsibility for damage to any part of the permanent work shall be as set forth in the Contract Clause PERMITS AND RESPONSIBILITIES. However, if, in the judgement of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by flood (see Section 00800 SPECIAL CONTRACT REQUIREMENTS, paragraph PHYSICAL DATA, subparagraph FLOODS) or earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make repairs as ordered by the Contracting Officer and full compensation for such repairs to permanent work will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, for any part of such damaged permanent work, there is no applicable contract unit or lump sum price, then an equitable adjustment pursuant to the Contract Clause CHANGES will be made as full compensation for the repairs for that part of the permanent work for which there is no applicable contract unit or lump sum price.

b. Except as herein provided, damage to all work (including temporary construction), utilities, materials, equipment, and plant shall be repaired to the satisfaction of the Contracting Officer, at the Contractor's expense, regardless of the cause of such damage.

1.25 ENERGY CONSERVATION

The Contractor shall ensure that construction operations are conducted efficiently and with the minimum use of energy.

1.26 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with Contract Clause DEFAULT (FIXED PRICE CONSTRUCTION). In order for the Contracting Officer to award a time extension under this paragraph, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON FIVE (5) DAY WORK WEEK

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

(5) (5) (5) (5) (6) (4) (4) (3) (3) (4) (5) (6)

c. Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor shall record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. The number of actual adverse weather days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b, above, the contracting officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with Contract Clause DEFAULT (FIXED PRICE CONSTRUCTION).

1.27 CONTROL OF ACCESS TO CONSTRUCTION AREAS

a. This paragraph supplements the Contract Clauses PERMITS AND RESPONSIBILITIES and OPERATIONS AND STORAGE AREAS.

b. It shall be the responsibility of the Contractor to prevent possible injury to visitors to the project site. Only personnel engaged in contract work and others authorized by the Contracting Officer shall be permitted to enter into the construction areas. Suitable barriers, warning signs and directives shall be placed by the Contractor to direct persons not engaged in the work away from the areas of danger. The Contractor shall be responsible for effective enforcement of this paragraph during the period of this contract.

1.28 HARBOR MAINTENANCE FEE

a. Offerors or bidders contemplating use of U.S. ports in the performance of contract are subject to paying a harbor maintenance fee on cargo. Federal law establishes an ad valorem port use fee on commercial cargo imported into or exported from various U.S. ports. The fee is 0.125 percent (0.00125). Cargo to be used in performing work under contracts with the U.S. Government is not exempt from the fee, although certain exemptions do exist. Offerors are responsible for ensuring that the applicable fee and associated costs are taken into consideration in the preparation of their offers. Failure to pay the harbor maintenance fee may result in assessment of penalties by the Customs Service.

b. The statute is at Title 26 U.S. Code section 4461 and 4462. Department of Treasury Customs Service regulations implementing the statute, including a list of ports subject to the fee, are found at 19 CFR 24.24, Harbor Maintenance Fee. Additional information may be obtained from local U.S. Customs Service Offices or by writing to the Director, Budget Division, Office of Finance, Room 6328, U.S. Customs

Service, 1301 Constitution Avenue, N.W., Washington, D.C. 20229.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SAFETY INSPECTION CHECK LIST FOR CONSTRUCTION EQUIPMENT U. S. Army Engineer Division, Mississippi Valley		Date of Inspection		
Contractor or Unit		Contract No. or Activity		
Inspected by (Signature)		Approved by (Signature)		
Activity Inspected:				
NIGHT OPERATIONS				
NOTE: Corps of Engineers General Safety Requirements (EM 385-1-1) references are shown in parentheses.		Yes	No	Not App
1. General:				
a. On construction contracts, is there a designated Contractor's representative on duty during night operations?*				
b. Does the contractor have an approved Activity Hazard Analysis for night operations? (01.A.09)				
c. Has Activity Hazard Analysis been reviewed by all employees prior to start of operation and documented? (01.B.03)				
d. Is each new employee provided with initial safety orientation? (01.B.01)				
e. Are emergency phone numbers posted and at least 2 qualified first aid and CPR attendants on duty? (03.A.01, 03.A.02)				
f. Are weekly safety meetings being held for night shift employees, by field supervisors or foremen?				
g. Are regularly scheduled safety meetings being held, at least once a month, for night shift supervisors? (03.B.03)				
h. Are outlines of each safety meeting being maintained at project site? (01.B.03)				
2. Lighting:				
a. Is there adequate lighting in work areas? (07.A.01, Table 7-1, 16.A.11)				
b. Is there adequate lighting on decks, walkways and floating plant? (07.A.01, Table 7-1)				
c. Is there adequate lighting at crew boat loading dock and unloading areas? (07.A.01, Table 7-1)				
d. Are semi-portable equipment, floodlights, and work lights provided with protective grounding, if not exempted by NEC? (11.C.01)				
3. Transportation to and from floating plant:				
a. Is boat equipped with sufficient number of life preservers? (05.I.01)				
b. Is weather deck of boat coated with non-skid material? (19.B.01)				
c. Do guardrails meet requirements of EM 385-1-1? (19.B.01, 21.B.01, 21.B.07)				
d. If boat is more than 26 feet in length, does operator hold a current Coast Guard license? (19.A.02)				
e. If more than 6 passengers are carried, or boat length is greater than 26 feet in length, is vessel Coast Guard certified and operator licensed? (19.A.02)				
f. Does motor boats and skiffs meet minimum flotation requirements of Coast Guard? (19.C.02)				
g. Does boat have running lights as required by 33 CFR 81 APPA and 33 CFR 84 ANNEX 1 (regardless of length)?				
h. Is the capacity of boat and maximum no. of passengers posted in accordance with EM-385-1-1? (19.C.03)				
j. Is there safe, easy access from boat to landing? (19.B.01, 19.B.02))				
4. Miscellaneous:				
a. Are haul roads properly marked for night work?				
b. Are necessary access and haul roads provided to work area? (21.I.01)				
c. Are all employees dressed suitable for night operations? Minimum shall be short sleeve shirt, long trousers and leather or other protective work shoes.				
d. Are all vehicles and construction equipment properly lighted for night work? (18.A.04, 16.A.11)				
e. Does flag or signal person have reflectorized warning garments? (08.B.08)				
f. Are all spotters or signal personnel adequately trained for operation? (08.B.10)				
5. REMARKS:				
* (Ref. Contract General Provisions).				

SAFETY INSPECTION CHECK LIST FOR CONSTRUCTION EQUIPMENT U. S. Army Engineer Division, Mississippi Valley		Date of Inspection		
Contractor or Unit		Contract Number - Job Description		
Type of Equipment & Boom Length		Make, Model No., Identification		
Inspected by (Signature)		Approved by (Signature)		
CRANES AND DERRICKS NOTE: Corps of Engineers General Safety Requirements (EM 385-1-1) references are shown in parentheses.		Yes	No	Not App
1. Is a list of the required clearances from overhead power lines posted? If necessary to work near power lines, boom shall have insulating cage guard and load line shall have insulating link. (11.E.04, 11.E.07)				
2. Are load rating charts with the machine? (16.C.01, 16.C.13)				
3. Is a list of standard hand signals posted in cab? (16.C.10, 08.B.01, 08.B.02)				
4. Are shock absorbing boom stops installed on machine? (16.D.02)				
5. Has the manufacturer certified the boom stops? (16.D.02)				
6. Does the boom angle, levelness, and other indicators operate accurately? (16.D.01)				
7. Does the unit have a suitable fire extinguisher? (16.A.26)				
8. Are moving parts, gears, drums, shafts, belts adequately screened or guarded? (16.B.03)				
9. Is there adequate protection from hot pipes, etc? (16.B.03)				
10. Are steps, ladders, guard rails, provided for safe footing and access? (16.B.03, 21.A.01)				
11. Can lubrication and greasing be done safely? (16.B.13)				
12. Is the cab equipped with unbroken distortion free safety glass? (16.B.10)				
13. Is fuel tank located so that overflow and spills will not run into cab or come in contact with exhaust ? (16.B.04)				
14. Is the unit shut down for fueling, servicing, etc? (16.A.14)				
15. Are slings, fastenings, fittings inspected daily by a qualified person? * Is wire rope inspected by a competent person frequently? (Section 15)				
16. When wedge socket type fasteners are used, has the dead end been made secure against loosening? (15.B.04)				
17. Have the air tanks been tested and certified? (20.A.02)				
18. Are test and inspection records kept available as a part of the official project file? (16.A.01)				
19. Is there evidence of deformed, cracked, or corroded members in the crane structure or boom? * (ANSI)				
20. Do the drums have proper pawls or positive locking devices? (16.B.14)				
21. Is there sufficient cable available so as to allow three full wraps on the drum at all working positions? (16.C.09)				
22. Are daily inspections being made of all control mechanisms to assure that there is no maladjustment interfering with proper operation? *				
23. Are inspections being made, at least monthly, of control mechanisms for excessive wear of components, and contamination by lubricants, or other foreign matter? *				
24. Are frequent (daily to monthly) inspections being made of all safety devices? *				
25. Are daily inspections for deterioration, or leakage in air or hydraulic systems being made? *				
26. Are crane hook inspections being made frequently (daily to monthly) to assure that there are no cracks or that the normal hook throat opening has not increased more than 15% *				
27. Is there evidence of loose bolts or rivets? * (ANSI)				
28. Is there evidence of cracked or worn sheaves or drums? (15.F.04)				
29. Are parts such as pins, bearings, shafts, gears, rollers, and locking devices worn, cracked, or distorted?				
* (Ref Contract Special Clauses)		(Continued on reverse)		

CRANES AND DERRICKS						Yes	No	Not App																																														
30. Is there evidence of excessive wear on brake and clutch system parts? *																																																						
31. Is there evidence of excessively worn or damaged tires? *																																																						
32. Is the power plant in good mechanical condition? *																																																						
33. Are accessible areas within the swing radius of the rear barricaded? (16.C.08)																																																						
34. Has a boom hoist disengaging device been installed on cranes with cable supported booms? (16.D.02)																																																						
35. Is there a current set of operator's manuals available? (16.C.01)																																																						
36. Are cranes and derricks operated by qualified operators? (16.C.04)																																																						
37. Have lattice and Hydraulic cranes been equipped with a device to stop the load hoisting before the load block contacts the boom tip? (16.D.01)																																																						
<p>38. <u>Crane Stability Test:</u></p> <p style="margin-left: 40px;">Amount of counterweight: _____ lb.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: 40px;"> <thead> <tr> <th rowspan="2" style="width: 10%;">Boom Angle</th> <th rowspan="2" style="width: 15%;">Distance from Center Pin to Load Line R (ft)</th> <th colspan="2" style="width: 20%;">Tipping Load I (lb)</th> <th colspan="2" style="width: 20%;">Moment R x I</th> <th colspan="2" style="width: 20%;">Maximum Allowable Load L=0.75 I</th> </tr> <tr> <th style="width: 10%;">With Outriggers</th> <th style="width: 10%;">Without Outriggers</th> <th style="width: 10%;">With Outriggers</th> <th style="width: 10%;">Without Outriggers</th> <th style="width: 10%;">With Outriggers</th> <th style="width: 10%;">Without Outriggers</th> </tr> </thead> <tbody> <tr> <td>20°</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>40°</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>60°</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>80°</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>									Boom Angle	Distance from Center Pin to Load Line R (ft)	Tipping Load I (lb)		Moment R x I		Maximum Allowable Load L=0.75 I		With Outriggers	Without Outriggers	With Outriggers	Without Outriggers	With Outriggers	Without Outriggers	20°	_____	_____	_____	_____	_____	_____	_____	40°	_____	_____	_____	_____	_____	_____	_____	60°	_____	_____	_____	_____	_____	_____	_____	80°	_____	_____	_____	_____	_____	_____	_____
Boom Angle	Distance from Center Pin to Load Line R (ft)	Tipping Load I (lb)		Moment R x I		Maximum Allowable Load L=0.75 I																																																
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80°	_____	_____	_____	_____	_____	_____	_____																																															
<p>39. <u>Performance Test:</u></p> <p style="margin-left: 40px;">a. Complete items 1-32 on this form.</p> <p style="margin-left: 40px;">b. Determine performance test load (PTL) from the stability test above with the boom at the 80° position. PTL=(1.25)(L)</p> <p style="margin-left: 40px;">c. Position the boom in the 80° position and allow the crane to lift, lower, and hold the performance test load.</p>																																																						
<p>40. Remarks</p>																																																						

SAFETY INSPECTION CHECK LIST FOR CONSTRUCTION EQUIPMENT U. S. Army Engineer Division, Mississippi Valley		Date of Inspection		
Contractor or Unit		Contract Number - Job Description		
Type of Equipment		Identification		
Inspected by (Signature)		Approved by (Signature)		
CRAWLER TRACTORS - DOZERS NOTE: Corps of Engineers General Safety Requirements (EM 385-1-1) references are shown in parentheses.		Yes	No	Not App
1. Is protection, (grills, canopies, screens) provided to shield operator from falling or flying objects? (16.B.10, 16.B.11)				
2. Is adequate roll over protection provided? (16.B.12)				
3. Are seat belts provided? (16.B.08, 16.b.12)				
4. Is the operator physically qualified? (01.C.01)				
5. Does the unit have a suitable fire extinguisher? (16.A.26)				
6. Is there an effective, working reverse alarm? (16.B.01)				
7. Are moving parts, shafts, sprockets, belts, etc. guarded? (16.B.03, 16.B.07)				
8. Is protection against contact with hot surfaces, exhaust, etc. provided? (16.B.03)				
9. Are all screens, guards, shields in place and effective? (16.B.03)				
10. Is the unit shut down for fueling, servicing, etc? (16.A.14)				
11. Is the dozer blade lowered when not in use? (16.A.09)				
12. Are sufficient lights provided for night operations? (16.A.11)				
13. Are there initial inspections and scheduled inspections of the equipment at regular intervals? (16.A.01, 16.A.02)				
14. Are fuel tanks located in a manner to prevent spills or overflows from running onto engine, exhaust, or electrical equipment? (16.B.04)				
15. Are exhaust discharges from equipment so directed that they do not endanger persons or obstruct the view of the operator? (16.B.05)				
16. Are inspection records kept available as a part of the official project file? (16.A.01)				
28. REMARKS:				

SAFETY INSPECTION CHECK LIST FOR CONSTRUCTION EQUIPMENT U. S. Army Engineer Division, Mississippi Valley		Date of Inspection		
Contractor or Unit		Contract Number - Job Description		
Type of Equipment & Boom Length		Make, Model No., Identification		
Inspected by (Signature)		Approved by (Signature)		
Equipment Inspected:				
DRAGLINES NOTE: Corps of Engineers General Safety Requirements (EM 385-1-1) references are shown in parentheses.		Yes	No	Not App
1. Is a list of the required clearances from overhead power lines posted? If necessary to work near power lines, boom shall have insulating cage guard and load line shall have insulating link. (11.E.04, 11.E.07)				
2. Does the unit have a suitable fire extinguisher? (16.A.26)				
3. Are moving parts, gears, drums, shafts, belts adequately screened or guarded? (16.B.03)				
4. Is there adequate protection from hot pipes, etc? (16.B.03)				
5. Are steps, ladders, guardrails, provided for safe footing and access? (16.B.03)				
6. Can lubrication and greasing be done safely? (16.A.08, 16.B.13)				
7. Is the cab equipped with unbroken safety glass? (16.B.10)(18.A.07)				
8. Is the fuel tank located so that overflow and spills will not run into cab or come in contact with exhaust? (16.B.04)				
9. Is the unit shut down for fueling, servicing, etc? (16.A.14)				
10. Is wire rope being inspected by a competent person frequently? (Daily to Monthly) (15.A.02)				
11. When wedge socket type fasteners are used, has the dead end been made secure against loosening? (15.B.04)				
12. Have the air tanks been tested and certified? (20.A.02,20.A.03)				
13. Are test records kept available as part of the official project file? (16.A.01)				
14. Is there evidence of deformed, cracked, or corroded members in the crane structure or boom?				
15. Do the drums have proper pawls or positive locking devices? (16.B.14)				
16. Is there sufficient cable available so as to allow three full wraps on the drum at all working positions? (16.C.09)				
17. Are daily inspections being made of all control mechanisms to assure that there is no maladjustment interfering with proper operation? (16.A.01,.02,.05)				
18. Are inspections being made, at least monthly, of control mechanisms for excessive wear of components, and contamination by lubricants, or other foreign matter? (16.A.01,.02,.05)				
19. Are frequent (daily to monthly) inspections being made of all safety devices? (16.A.01,.02,.05)				
20. Are daily inspections for deterioration, or leakage in air or hydraulic systems being made? (16.A.01,.02,.05)				
21. Is there evidence of loose bolts or rivets?				
22. Is there evidence of cracked or worn sheaves or drums?				
23. Are parts such as pins, bearings, shafts, gears, rollers, and locking devices worn, cracked, or distorted?				
24. Is there evidence of excessive wear on brake and clutch system parts?				
25. Is there evidence of excessively worn or damaged tires?				
26. Is the power plant in good mechanical condition?				
27. Is there evidence that the operator(s) are physically and emotionally qualified? (01.C.01)				
28. REMARKS:				

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SECTION 01025
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 - 1.1.1 General
 - 1.1.2 Lump Sum Items

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section Table of Contents --

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 LUMP SUM PAYMENT ITEMS

1.1.1 General

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, submittal procedures, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.1.2 Lump Sum Items

a. "Site ____" (each site as listed below)

HKL-130	HKL-136	HKL-142
HKL-131	HKL-137	HKL-143
HKL-132	HKL-138	HKL-144
HKL-133	HKL-139	
HKL-134	HKL-140	
HKL-135	HKL-141	

(1) Payment will be made at each site for all costs associated with constructing the riser pipe grade control structure, including all work required at the site, and all work incidental thereto.

(2) Unit of measure: lump sum.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

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- 1.2 ORDERING INFORMATION

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PART 3 EXECUTION (Not Applicable)

-- End of Section Table of Contents --

SECTION 01090

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the sponsoring organization, e.g.

UL 1 (1993; Rev thru Jan 1995) Flexible Metal Conduit. However, when the sponsoring organization has not assigned a number to a document, an identifying number has been assigned for convenience, e.g. UL's unnumbered 1995 edition of their Building Materials Directory is identified as UL-01 (1995) Building Materials Directory. The sponsoring organization number (UL 1) can be distinguished from an assigned identifying number (UL-01) by the lack of a dash mark (-) in the sponsoring organization assigned number.

1.2 ORDERING INFORMATION

The addresses of the organizations whose publications are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the sponsoring organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)

P.O. Box 9094
Farmington Hills, MI 48333-9094
Ph: 248-848-3700
Fax: 248-848-3801
Internet: <http://www.aci-int.org>
AOK6/99

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
Ph: 610-832-9585
Fax: 610-832-9555
Internet: www.astm.org
NOTE: The annual ASTM Book of Standards (66 Vol) is available for \$3500.00. Prices of individual standards vary.
AOK6/99

AMERICAN WELDING SOCIETY (AWS)

550 N.W. LeJeune Road
Miami, FL 33126
Ph: 800-443-9353
Fax: 305-443-7559

Internet: <http://www.amweld.org>
AOK6/99

ASME INTERNATIONAL (ASME)

Three Park Avenue
New York, NY 10016-5990
Ph: 212-591-7722
Fax: 212-591-7674
Internet: www.asme.org
AOK6/99

CODE OF FEDERAL REGULATIONS (CFR)

Order from:
Government Printing Office
Washington, DC 20402
Ph: 202-512-1800
Fax: 202-275-7703
Internet: <http://www.pls.com:8001/his/cfr.html>
AOK6/99

CORPS OF ENGINEERS (COE)

Order from:
U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services
Branch, TIC
3909 Halls Ferry Rd.
Vicksburg, MS 39180-6199
Ph: 601-634-2571
Fax: 601-634-2506
NOTE: COE Handbook for Concrete and Cement (Documents w/prefix
CRD-C) (1949-present; 2 Vol) free to Government offices; \$10.00
plus \$8.00 per yr for 4 qtrly supplements to others). Individual
documents, single copies free. Order from address above.
AOK6/99

ENGINEERING MANUALS (EM)

USACE Publications Depot
Attn: CEIM-SP-D
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
AOK6/99

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

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SECTION 01130

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 DEFINITIONS

Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents that adversely affect human health or welfare; unfavorably alter ecological balances of importance to life; or degrade the environment for aesthetic, cultural or historical purposes. Environmental protection is the prevention and/or control of pollution that develops during normal construction practice. The control of environmental pollution and damage requires consideration of air, water, soil, and land resources; and includes management of visual aesthetics; noise; solid, chemical, and liquid waste; radiant energy and radioactive materials; and other pollutants.

1.2 ENVIRONMENTAL PROTECTION REQUIREMENTS

A plan shall be developed to provide for environmental protective measures to prevent and/or control pollution that may develop during construction. The plan shall contain protective measures required to prevent or correct conditions that may develop during the construction. The liability for environmental noncompliance shall be borne by the Contractor.

1.2.1 Environmental Protection Plan

Within 15 days after receipt of Notice of Award of the contract and at least 7 days prior to the Preconstruction Conference, the Contractor shall submit in writing an Environmental Protection Plan. No physical work at the site shall begin until the Contracting Officer has approved the plan and provided specific authorization to start a phase of the work. Preparation and submittal of supplemental plan(s) may be necessary for later phases of work. A copy of the complete Environmental Protection Plan shall be maintained on-site at all times during the life of the contract. The environmental protection plan shall include but not be limited to the following.

1.2.1.1 Protection of Features

In accordance with Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS, the Contractor shall develop methods for the protection of features to be preserved within authorized work areas. The Contracting Officer will prepare a list of resources needing protection and preservation (i.e., trees, shrubs, vines, grasses and ground cover, landscape features, air quality, noise levels, surface and ground water quality, fish and wildlife, soil, historic, archaeological and cultural resources). The Contractor's plan shall identify methods to protect these and other resources present and specify measures to protect the environment should an accident, natural causes of pollution, or failure to follow the environmental protection plan occur during construction. The Contractor's plan shall specify how the quality and protective measures of these resources shall be monitored. Furthermore the Contractor's plan shall specify how and where waste shall be disposed.

1.2.1.2 Procedures

The Contractor shall implement procedures to provide the required environmental protection and to comply with the applicable laws and regulations. The Contractor shall set out the procedures to be followed to correct pollution of the environment due to accident, natural causes or failure to follow the procedures set out in accordance with the environmental protection plan.

1.2.1.3 Drawings

The Contractor shall include drawings identifying the areas of limited use or nonuse and show locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, stockpiles of earth materials, and disposal areas for excess earth material and unsuitable earth materials.

1.2.1.4 Recycling and Waste Prevention Plan

The Contractor shall submit as a part of the Environmental Protection Plan, a Recycling and Waste Prevention Plan.

1.2.1.5 Environmental Monitoring Plans

The Contractor shall include environmental monitoring plans for the job site which incorporate land, water, air and noise monitoring.

1.2.1.6 Traffic Control Plan

The Contractor shall include a traffic control plan for the job site. This plan shall focus on reducing erosion of temporary roadbeds by construction traffic, especially during wet weather, and reducing the amount of mud transported onto paved public roads by motor vehicles or runoff.

1.2.1.7 Surface and Ground Water

The Contractor shall establish methods of protecting surface and ground water during construction activities. These water courses shall be protected from pollutants such as petroleum products, fuels, oils, lubricants, bentonite, bitumens, calcium chloride, acids, waste washings, sewage, chlorinated solutions, herbicides, insecticides, lime, wet concrete, cement, silt, or organic or other deleterious material. Chemical emulsifiers, dispersants, coagulants, or other cleanup compounds shall not be used without prior written approval from the Contracting Officer. Waters used to wash equipment shall be disposed to prevent entry into a waterway until treated to an acceptable quality. Fuels, oils, greases, bitumens, chemicals, and other nonbiodegradable materials shall be contained with total containment systems and removed from the site for disposal in an approved manner.

1.2.1.8 Noise Intrusion

The Contractor shall exercise controls to minimize damage to the environment by noise from construction activities. All Contractor's, subcontractors', and suppliers' equipment used on or in the vicinity of the job site shall be equipped with noise suppression devices. Equipment not so suppressed and properly maintained must be approved for use in writing by the Contracting Officer. Areas that have noise levels greater than 85

dB continuous or 140 dB peak (unweighted) impulse must be designated as noise hazardous areas. These work areas must have caution signs displayed at the perimeter of the noise area indicating the presence of hazardous noise levels and requiring the use of hearing protection devices.

1.2.1.9 Work Area Plan

The Contractor shall include a work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. The plan shall include measures for marking the limits of use areas.

1.2.1.10 Plan of Borrow Area(s)

The Contractor shall include a plan of borrow area(s) for the project.

1.2.1.11 Contaminant Prevention Plan

The Contractor shall identify potentially hazardous substances to be used on the job site and intended actions to prevent accidental or intentional introduction of such materials into the air, water or ground. The Contractor shall detail provisions to be taken regarding the storage and handling of these materials. The plan shall include, but not be limited to, plans for preventing polluted runoff from plants, parked equipment, and maintenance areas from entering local surface and ground water sources.

1.3 ENVIRONMENTAL LITIGATION

a. If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor, or a Subcontractor at any tier, not required by the terms of the contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor, or a Subcontractor at any tier, other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the SUSPENSION OF WORK clause of this contract. The period of such suspension, delay, or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

b. The term "Environmental Litigation", as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 PROTECTION OF ENVIRONMENTAL RESOURCES

The Contractor shall protect the environmental resources (such as, but not limited to, historic, archaeological and cultural resources; land, water,

and air resources; and fish and wildlife resources) within the project boundaries and those affected outside the limits of permanent work under this contract.

3.1.1 Protection of Land Resources

In accordance with Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS, the land resources within the project boundaries and those affected outside the limits of work under this contract shall be preserved in their present condition or be restored to an equivalent condition upon completion of the work. Prior to initiating any construction, the Contractor shall identify all land resources to be preserved within the work area, including those identified by the Contracting Officer. The Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and landforms without permission from the Contracting Officer unless otherwise specified. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times and shall be responsible for any subsequent damage as defined in the following subparagraphs.

3.1.1.1 Work Area Limits

Prior to any construction, the Contractor shall mark the areas within the designated work areas that are not required to accomplish work to be performed under this contract and which are to be protected. Isolated areas within the general work area which are to be saved and protected shall be marked or fenced. Monuments and markers shall be protected during construction. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor shall convey to his personnel the purpose of marking and protecting all necessary objects.

3.1.1.2 Protection of Landscape

Trees, shrubs, vines, grasses, landforms and other landscape features, indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

3.1.1.3 USDA Quarantined Considerations

See Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph WORK IN QUARANTINED AREA.

3.1.1.4 Location of Contractor On-Site Facilities

The Contractor's on-site field offices, staging areas, stockpile storage, and temporary buildings shall be placed in approved areas. Temporary movement or relocation of Contractor on-site facilities shall be only on approval by the Contracting Officer.

3.1.1.5 Borrow Areas

Borrow areas off Government right-of-way shall be managed by the Contractor to minimize erosion and to prevent sediment from entering nearby water courses or lakes, or affecting known or discovered cultural resource properties. All borrow areas outside the construction limits that are

operated by the Contractor shall be reclaimed to provide for the protection and subsequent beneficial use of the mined and reclaimed land. Before obtaining material from any borrow source located outside the project limits, whether operated by the Contractor or by an independent supplier, the Contracting Officer shall be informed in writing of the location of such source(s), the names of the owner and operator, and the types and estimated quantities of materials to be obtained from each source.

3.1.1.6 Disposal of Solid Wastes

Solid wastes (not including clearing debris) shall be any waste excavated or generated by the Contractor. Solid waste shall be placed in containers and disposed on a regular schedule. All handling and disposal shall be conducted to prevent spillage and contamination. The Contractor shall transport all solid waste off government property and dispose properly. The Contractor shall participate in any State or local recycling programs to reduce the volume of solid waste materials at the source whenever practical.

3.1.1.7 Disposal of Hazardous Wastes

Hazardous waste shall be stored, removed from the work area, and disposed of in accordance with all applicable Federal, State, and local laws and regulations. Hazardous waste shall not be dumped onto the ground, into storm sewers or open water courses, or into the sanitary sewer system. Fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spills and evaporation.

3.1.1.8 Disposal of Discarded Materials

Discarded materials that cannot be included in the solid waste category shall be handled as approved.

3.1.1.9 Disposal of Waste Oils

Waste oils and/or lubricants shall be disposed of in accordance with all Federal, State, and local laws and regulations. The Contractor shall collect waste oil and/or lubricants in leak-tight containers, ensure that all openings on the containers are tightly sealed (including the drum ring and bung closures), and label the containers to clearly indicate contents. Disposal through a waste oil recycler is required. The Contractor shall ensure that the recycler has all appropriate State and Federal permits.

3.1.2 Historical, Archaeological and Cultural Resources

The Contractor shall take precautions to preserve existing historical, archaeological and cultural resources. The Contractor shall install protection for these resources and shall be responsible for their preservation during this contract. If during construction activities the Contractor observes items that may have archaeological or historic value (e.g., when Native American human remains and associated objects are discovered), the Contractor shall stop work in the area, leave the items undisturbed, and immediately report the find to the Contracting Officer. Such items may include historic artifacts of glass, metal and ceramics, or prehistoric artifacts such as stone tools, ceramics, bone, and shell. The Contractor shall not judge the potential significance of any suspected cultural material, but shall report all findings to the Contracting Officer.

3.1.3 Protection of Water Resources

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Discharges of any pollutant into the water courses is strictly prohibited, unless excepted by the Contracting Officer.

3.1.3.1 Waste Water

Waste water directly derived from washing equipment, curing concrete, or any other construction activities shall not be discharged into natural water areas.

3.1.3.2 Monitoring of Water Areas Affected by Construction Activities

The Contractor shall be responsible for monitoring all water areas affected by construction activities. In the event that water quality violations result from the Contractor's operation, the Contractor shall suspend the operation or operations causing the pollution, and such suspension shall not form the basis for a claim against the Federal government.

3.1.4 Protection of Aquatic and Wildlife Resources

The Contractor shall keep construction activities under surveillance, management, and control to prevent interference with, disturbance to, and damage to aquatic resources and/or wildlife. Species that require specific attention as defined by law or specified by the Contracting Officer, along with measures for their protection, shall be listed by the Contractor prior to beginning of construction operations.

3.1.5 Protection of Air Resources

The Contractor shall keep construction activities under surveillance, management and control to minimize pollution of air resources. Special management techniques as set out below shall be implemented to control air pollution by the construction activities.

3.1.5.1 Particulates

Dust particles, aerosols, and gaseous by-products from all construction activities, disturbed areas, and/or processing and preparation of materials, such as from asphaltic batch plants, shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. The Contractor shall maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, disposal sites, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause air pollution standards specified in paragraph PROTECTION OF AIR RESOURCES to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling shall be repeated at such intervals as to keep the disturbed area damp at all times.

3.1.5.2 Hydrocarbons and Carbon Monoxide

Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal, State, and local allowable limits at all times.

3.1.5.3 Volatile Organic Compound (VOC)

The Contractor shall comply with Federal, State, and local laws and regulations pertaining to emission of VOC vapors at all times.

3.1.5.4 Odors

Odors shall be controlled at all times for all construction activities, including processing and preparation of materials.

3.1.5.5 Monitoring Air Quality

Monitoring of air quality at the construction site(s) shall be the responsibility of the Contractor.

3.2 NONCOMPLIANCE

If the Contracting Officer notifies the Contractor in writing of any observed noncompliance with contract requirements or Federal, State, or local laws, regulations, or permits, the Contractor shall take all necessary action to correct the noncompliance. If the Contractor fails to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action is taken. No time extensions will be granted or costs or damage allowed to the Contractor for any such suspension. (See also the Contract Clause PERMITS AND RESPONSIBILITIES.)

3.3 CONTAINMENT AND CLEANUP OF CONTAMINANT RELEASES

The Contractor shall provide the Contracting Officer for approval, a contaminant containment and cleanup plan including the procedures, instructions, and reports to be used in the event of an unforeseen substance release. This plan shall include as a minimum:

- a. The name of the individual who will be responsible for implementing and supervising the containment and cleanup.
- b. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
- c. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material placement equipment available in case of an unforeseen spill emergency.
- d. The methods and procedures to be used for expeditious contaminant cleanup.
- e. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer in addition to the legally required reporting channels when a reportable quantity spill of oil or hazardous substance occurs.

3.4 POST CONSTRUCTION CLEANUP

The Contractor shall clean up areas used for construction and remove all signs of temporary construction facilities; Contractor office, storage and

staging areas; quarry and borrow areas, and all other areas used by the Contractor during construction. Furthermore, the disturbed areas shall be graded and filled as approved by Contracting Officer. Restoration of original contours is not required unless specified in another section. (See also the Contract Clause CLEANING UP.)

3.5 RESTORATION OF LANDSCAPE DAMAGE

All landscape features damaged or destroyed during construction operations that were not identified for removal shall be restored. Any vegetation or landscape feature damaged shall be restored as nearly as possible to its original condition. (See also the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.)

3.6 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain all constructed facilities and portable pollution control devices for the duration of the contract or for the length of time construction activities create the particular pollutant.

3.7 TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

Contractor personnel shall be trained in environmental protection and conduct environmental protection meetings monthly. The training and meeting agenda shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities (vegetative covers, and instruments required for monitoring purposes) to insure adequate and continuous environmental pollution control. Personnel are to be informed of provisions for hazardous and toxic materials container labeling and for managing Material Safety Data Sheets (MSDS). Anticipated hazardous or toxic chemicals shall also be reviewed. Other items to be discussed shall include recognition and protection of archaeological sites and artifacts. The Contractor shall include training topics discussed and attendance as a part of his daily CQC Report.

-- End of Section --

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SECTION 01330

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SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL DESCRIPTIONS

The submittals described below are those required and further described in other sections of the specifications. Submittals required by the CONTRACT CLAUSES and other non-technical parts of the contract are not included in this section.

SD-01 Data

Submittals which provide calculations, descriptions, or other documentation regarding the work.

SD-08 Statements

A document, required of the Contractor, or through the Contractor, by way of a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to further the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

SD-09 Reports

Reports of inspection and laboratory test, including analysis and interpretation of test results. Test methods used and compliance with recognized test standards shall be described.

SD-13 Certificates

Statement signed by responsible official of a manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of this contract, name the project, and list the specific requirements which it is intended to address.

SD-14 Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause, SPECIFICATIONS AND DRAWINGS FOR

CONSTRUCTION, they are considered to be "shop drawings."

1.2.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.3 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause CHANGES shall be given promptly to the Contracting Officer.

1.5 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each item shall be stamped, signed, and dated by the CQC representative indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples

remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

At the end of this section is one set of ENG Form 4288 listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. Columns "d" through "q" have been completed by the Government; the Contractor shall complete columns "a" and "s" through "u" and submit the forms to the Contracting Officer for approval within 10 calendar days after Notice to Proceed. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. The submittal register and the progress schedules shall be coordinated.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

3.4 TRANSMITTAL FORM (ENG FORM 4025-R)

The sample transmittal form (ENG Form 4025-R) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

3.5.1 Procedures

Submittals shall be prepared, as specified, with four (4) copies and the original delivered to the Contracting Officer.

3.5.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025-R shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor

scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Three (3) copies of the submittal will be retained by the Contracting Officer and one (1) copy of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.9 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or
attached sheets(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

-- End of Section --

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE <i>(Read instructions on the reverse side prior to initiating this form)</i>	DATE	TRANSMITTAL NO.
---	------	-----------------

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. <i>(Cover only one section with each transmittal)</i>	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR <input type="checkbox"/> FIO <input type="checkbox"/> GOV'T. APPROVAL

ITEM NO.	DESCRIPTION OF ITEM SUBMITTED <i>(Type size, model number/etc.)</i>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <i>(See instruction no. 8)</i>	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE	VARIATION <i>(See instruction No. 6)</i>	FOR CE USE CODE
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated. _____ NAME AND SIGNATURE OF CONTRACTOR
---------	---

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED <i>(List by Item No.)</i>	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE
---	--	------

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other (<i>Specify</i>)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

(ER 415 1-10)

02213

SPECIFICATION SECTION

[illegible]

(ER 415 1-10)

02220

SPECIFICATION SECTION

[illegible]

(ER 415 1-10)

02542

SPECIFICATION SECTION

[illegible]

(ER 415 1-10)

02719

SPECIFICATION SECTION

[illegible]

(ER 415 1-10)

02960

SPECIFICATION SECTION

[illegible]

(ER 415 1-10)

02961

CONTRACTOR

02961

[illegible]

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SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(1996) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(1995c) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause INSPECTION OF CONSTRUCTION. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both on-site and off-site, and shall be keyed to the proposed construction sequence.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 15 days after receipt of Notice of Award of the contract and at least 7 days prior to the Preconstruction Conference, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause INSPECTION OF CONSTRUCTION. The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both on-site and off-site, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC system manager who shall report to the project manager or someone higher in the Contractor's organization. Project manager in this context shall mean the individual with responsibility for the overall management of the project including quality and production.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters will also be furnished to the Government.
- d. Procedures for laying out the work, verifying that the work has been constructed as required, and documenting the results of these quality control activities.
- e. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.
- f. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved.)
- g. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- h. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.
- i. Reporting procedures, including proposed reporting formats.
- j. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section.

This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the Contractor's Quality Control Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The Contractor shall contact the Government to mutually schedule the Coordination Meeting at least 48 hours in advance of conducting the meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

The Contractor shall identify an individual within his organization at the worksite who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. This CQC System Manager shall be on the site at all times during construction and will be employed by the Contractor, except as noted in the following. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager's absence. Period of absence may not exceed 2 weeks at any one time, and not more than 30 workdays during a calendar year. The requirements for the alternate will be the same as for the designated CQC Manager.

3.4.1 CQC Organizational Staffing

The Contractor shall provide a CQC staff which shall be at the worksite at all times during progress, with complete authority to take any action necessary to ensure compliance with the contract.

3.4.1.1 CQC Staff

Following are the minimum requirements for the CQC staff. These minimum requirements will not necessarily assure an adequate staff to meet the CQC requirements at all times during construction. The actual strength of the CQC staff may vary during any specific work period to cover the needs of the work period. When necessary for a proper CQC organization, the Contractor will add additional staff at no cost to the Government. This listing of minimum staff in no way relieves the Contractor of meeting the basic requirements of quality construction in accordance with contract requirements. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.1.2 CQC System Manager

The CQC System Manager shall be an experienced construction person with a minimum of 5 years experience in related work. The CQC System Manager, and alternate when serving as System Manager, shall perform no other duties in addition to quality control, except that he may also be project superintendent. The CQC System Manager and alternate shall have successfully completed the course, "Construction Quality Management for Contractors". This course is periodically offered at Vicksburg, MS. (The POC for this course is Mr. James Waddle, CEMVK-CD-MQ, at (601) 631-5501.)

3.4.1.3 Supplemental Personnel

A staff shall be maintained under the direction of the CQC System Manager to perform all CQC activities. The staff must be of sufficient size to ensure adequate CQC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned CQC responsibilities and must be allowed sufficient time to carry out these responsibilities. The CQC Plan will clearly state the duties and responsibilities of each staff member.

3.4.2 Organizational Changes

The Contractor shall obtain Contracting Officer's acceptance before replacing any member of the CQC staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement.

3.5 SUBMITTALS

Submittals shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The Contractor shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6 CONTROL

The controls shall include at least three phases of control to be conducted by the CQC System Manager for all definable features of work, as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning each definable feature of work, after all required plans/documents are approved/accepted, and after all copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications.
- b. A review of the contract drawings.

- c. A check to assure that all materials and equipment have been tested, submitted, and approved.
- d. A check to assure that provisions have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for constructing the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that phase of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. The Government shall be notified at least 48 hours in advance of beginning any of the required action of the preparatory phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of preliminary work to ensure that it is in compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verification of full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be

prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work on-site, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

As determined by the Government, additional preparatory and initial phases may be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, on-site production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Testing includes operation and acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, will be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. If approved, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an off-site or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test

facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of \$2,000 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 On-Site Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory, f.o.b., at the following address:

Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, Mississippi 39180-6199

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch List Inspection

Near the completion of all work or any increment thereof established by a completion time stated in Section 00800 SPECIAL CONTRACT REQUIREMENTS, paragraph COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Such a list of deficiencies/uncompleted work shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies/uncompleted work shall be corrected/completed. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies/uncompleted work have been corrected/completed. Once this is accomplished the Contractor shall notify the Government that the facility is ready for the Government "Pre-Final"

inspection.

3.8.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied or put in use. A Government "Pre-Final Punch List" may be developed as a result of this inspection. Any items noted on the "Pre-Final" inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control System Manager, his Superintendent or other primary personnel, and the Contracting Officer's Representative shall be in attendance at this inspection. The customer and other Government personnel may also be in attendance. In the event of unavailability of the Contractor's representative, the Contracting Officer may elect to conduct the final acceptance inspection as scheduled. The Contracting Officer will formally schedule the final acceptance inspection based upon the results of the pre-final inspection. At least 14 days prior to the scheduled final acceptance inspection, the Contractor shall give the Contracting Officer a written notice of completion. The notice shall include the Contractor's assurance that all items previously identified to the Contractor as being unacceptable and all remaining work under the contract will be completed and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause INSPECTION OF CONSTRUCTION.

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

- f. Submittals reviewed, with contract reference, by whom, and action taken.
- g. Off-site surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section are:

- a. CONSTRUCTION QUALITY MANAGEMENT REPORT
- b. PREPARATORY PHASE CHECKLIST FORM
- c. INITIAL PHASE CHECKLIST FORM

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for additional costs or damages by the Contractor.

-- End of Section --

CONSTRUCTION QUALITY MANAGEMENT REPORT

Contractor: _____ Date: _____

Contract No. DACW38-_____Daily Report No._____

Project Title & Location: _____

Weather: _____ Precipitation: _____ in. emp.: _____ Min _____ Max

Work Control Feature: _____ Portion of Day Suitable for Work: ____%

1. Contractor/Subcontractors and Area of Responsibility:

NUMBER:	TRADE	HOURS	EMPLOYER	LOCATION/DESCRIPTION	WORK
---------	-------	-------	----------	----------------------	------

[illegible]

2. Operating Plant or Equipment. (Not hand tools)

PLANT/EQUIPMENT	DATE OF ARRIVAL/DEPART	DATE OF SAFETY CHECK	HOURS USED	HOURS IDLE	HOURS REPAIR
-----------------	---------------------------	-------------------------	---------------	---------------	-----------------

3. **Work performed today:** (Indicate location and description of work performed by prime and/or subcontractors by number in table (1) above.)

[illegible]

4. Results of control activities: (Indicate whether P - Preparatory, I - Initial, or F - Follow-up Phase. When a P or I meeting is conducted, complete attachment I-A or I-B, respectively. When network analysis system is used, identify work by use of I-J)

5. Tests performed as required by plans and/or specifications:

6. Materials received:

7. Submittals Reviewed:

(a) Submittal No.	(b) Spec/Plan Reference	(c) By Whom	(d) Action
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8. Offsite surveillance activities, including action taken:

9. Job safety: (Report violations; Corrective instructions given; Corrective actions taken.)

CQM REPORT FORM (Con't)

10. Remarks: (Instructions received or given. Conflict(s) in Plans and/or specifications.)

Contractor's Verification: On behalf of the Contractor, I certify this portion of the report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and specifications, to the best of my knowledge, except as noted above.

Authorized CQM System Manager Date

GOVERNMENT QUALITY ASSURANCE REPORT

1. Do you concur with the Contractor's Report for this period? ____Yes____*No
2. Did you observe any QC testing/inspections or perform any QA evaluations or verification of materials? ____*Yes____No
3. Were any instructions given to or information received from the Contractor? ____*Yes____No
4. Has anything developed on the work which, in your opinion, might lead to a change order or contract claim? ____*Yes____No

5. Safety Observations and General Comments/Remarks. (Use back of this form if more space is needed.) Answers to 1-4 above with an asterisk (*) are to be explained below.

I certify that this report is complete and accurate to the best of my knowledge.

Government Quality Assurance Representative Date

PREPARATORY PHASE CHECKLIST FORM

Contract No.: _____ Date: _____

Definable Feature: _____ Spec Section: _____

Government Rep Notified _____ Hours in Advance Yes _____ No _____

I. Personnel Present:

	NAME	POSITION	COMPANY/GOVERNMENT
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

(List additional personnel on reverse side)

II. Submittals

1. Review submittals and submittal log 4288. Have all submittals been approved? Yes _____ No _____

If No, what items have not been submitted?

- a. _____
b. _____
c. _____

2. Are all materials on hand? Yes _____ No _____

If No, what items are missing?

- a. _____
b. _____
c. _____

3. Check approved submittals against delivered material. (This should be done as material arrives.)

Comments _____

III. Material storage

Are materials stored properly? Yes _____ No _____

If No, what action is taken? _____

PREPARATORY PHASE CHECKLIST FORM (Cont'd)

IV. Specifications

1. Review each paragraph of specifications.

2. Discuss procedure for accomplishing the work.

3. Clarify any differences.

V. Preliminary Work

Ensure preliminary work is correct.

If not, what action is taken? _____

VI. Testing

1. Identify test to be performed, frequency, and by whom. _____

2. When required? _____

3. Where required? _____

4. Review Testing Plan. _____

5. Has test facilities been approved? _____

VII. Safety

1. Review applicable portion of EM 385-1-1. _____

2. Activity Hazard Analysis approved? Yes _____ No _____

VIII. Corps of Engineers comments during meeting.

CQC Representative

INITIAL PHASE CHECKLIST FORM

Contract No.: _____ Date: _____

Definable Feature: _____

Government Rep Notified: _____ Hours in Advance Yes _____ No _____

I. Personnel Present:

	NAME	POSITION	COMPANY/GOVERNMENT
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

(List additional personnel on reverse side)

II. Identify full compliance with procedures identified at preparatory phase. Coordinate plans, specifications, and submittals.

Comments: _____

III. Preliminary work. Ensure preliminary work is complete and correct. If not, what action is taken? _____

IV. Establish Level of Workmanship.

1. Where is work located? _____

2. Is a sample panel required? Yes _____ No _____

3. Will the initial work be considered as a sample? Yes _____ No _____
(If yes, maintain in present condition as long as possible.)

V. Resolve any Differences.

Comments: _____

INITIAL PHASE CHECKLIST FORM (Cont'd)

VI. Check Safety.

Review job condition using EM 385-1-1 and job hazard analysis.

Comments: _____

CQC Representative

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SECTION 02109

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

Clearing and grubbing work for construction shall be completed prior to excavation or embankment construction at each site. If regrowth of vegetation or trees occurs after clearing and grubbing and before construction, the Contractor will be required to clear and grub the area again prior to excavation or embankment construction. No payment will be made for this additional clearing and grubbing.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CLEARING

3.1.1 General

Clearing, unless otherwise specified, shall consist of the complete removal above the ground surface of all trees, stumps, down timber, snags, brush, vegetation, trash, old piling, loose stone, abandoned structures, underground structures, fencing, existing drainage structures, and similar debris.

3.1.2 Merchantable Timber

Merchantable timber remaining within the areas to be cleared on or after the date of award of this contract may be disposed of as the Contractor sees fit, as long as such merchantable timber is either removed from the Government furnished rights-of-way or is satisfactorily disposed of in accordance with paragraph DISPOSAL OF DEBRIS. The Contractor is precluded from making any claim for time extensions, costs, or damage to his operations by reason of the existence or nonexistence of merchantable timber, crops, debris, or stumps within the areas to be cleared.

3.1.3 Trees

Trees shall be felled in such a manner as to avoid damage to trees to be left standing, to existing structures and installations and to those under construction, and with due regard for the safety of employees and others.

3.1.4 Vegetation

Vegetation to be removed shall consist of crops, grass, bushes, and weeds. This vegetation shall be removed to form a completely bare earth surface.

3.1.5 Miscellaneous

3.1.5.1 Debris

The Contractor shall remove all debris and other materials which remain

after construction is complete.

3.1.5.2 Existing Fencing

The Contractor shall remove any existing fencing within the confines of the contract rights-of-way as required to facilitate construction. After completion of the grade control structures and diversions, the Contractor shall replace the fencing in kind and shall erect it in a manner similar to the removed fencing.

3.1.5.3 Temporary Fencing

The Contractor shall provide temporary fencing as required to keep livestock outside the construction limits. Temporary fencing shall be erected in a manner similar to the removed fencing and existing fencing.

3.1.5.4 Salvage

Existing corrugated metal pipe structures shown shall be salvaged and placed on site as directed for owner future use. Area is to be restored and dressed to drain.

3.1.5.5 Existing Public and Utilities

See Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph PUBLIC AND PRIVATE UTILITIES.

3.1.6 Areas to be Cleared

3.1.6.1 General

The entire area of the excavation and embankments shall be cleared of all trees, brush, drift, miscellaneous debris, or other obstruction that would hinder excavation or grading, and subsequent construction operations. Clearing shall be limited to the absolute minimum necessary for construction of the work, together with strips 1.5 meters wide contiguous thereto. Care shall be taken by the Contractor not to cut or injure any trees which do not unreasonably interfere with the construction. Growth around the work area shall be preserved to the maximum extent practicable. Clearing shall be limited to approved areas. All trees and brush within the areas authorized to be cleared shall be felled and together with drift and other debris shall be disposed of as directed in paragraph DISPOSAL OF DEBRIS.

3.1.6.2 Stockpile Areas

Areas for use as temporary stockpile areas, as approved, shall be cleared to the extent necessary to accommodate the materials and to preclude contamination of the materials.

3.2 GRUBBING

3.2.1 General

Grubbing shall consist of the removal of all stumps, roots, buried logs, and other unsuitable materials as described in Section 02226 EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER.

3.2.2 Areas to be Grubbed

3.2.2.1 Embankments and Structures

Grubbing shall be performed within the limits of the excavations and embankments and all structures together with the 1.5 meter strips contiguous thereto. All roots and other projections over 38 mm in diameter shall be removed to a depth of 300 mm below the natural surface of the ground.

3.2.3 Filling of Holes

All holes caused by grubbing operations shall be backfilled with suitable material in 300 mm layers to the elevation of the adjacent ground surface, and each layer compacted to a density at least equal to that of the adjoining undisturbed materials.

3.3 DISPOSAL OF DEBRIS

3.3.1 General

All debris resulting from construction operations at the site(s) shall be disposed of by removal from the site.

3.3.2 Removal

The Contractor shall remove all debris resulting from clearing and grubbing operations from the Government furnished rights-of-way. The Contractor may, at his option, retain for his own use or dispose of by sale or otherwise, any such materials of value. The Government assumes no responsibility for the protection or safekeeping of any materials retained by the Contractor. Such materials shall be removed from the site of work before the date of completion of the work under these specifications. When debris from clearing or grubbing operations is placed on adjacent property, the Contractor shall obtain, without cost to the Government and in accordance with Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph RIGHTS-OF-WAY, additional right-of-way for such purposes. Such material shall be so placed so as not to interfere with roads, drainage or other improvements and in such a manner as to eliminate the possibility of its entering the completed project.

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SECTION 02213

ENGINEERING FABRIC

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 2487	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 4354	(1996) Sampling of Geosynthetics for Testing
ASTM D 4355	(1992) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4439	(1998) Terminology for Geosynthetics
ASTM D 4491	(1996) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1996) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1995) Determining Apparent Opening Size of a Geotextile
ASTM D 4759	(1988; R 1996) Determining the Specification Conformance of Geosynthetics
ASTM D 4833	(1988; R 1996) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4873	(1997) Identification, Storage, and Handling of Geosynthetic Rolls
ASTM D 4884	(1996) Strength of Sewn or Thermally Bonded Seams of Geotextiles

1.2 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The

following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-08 Statements

Installation; FIO.

Details for attaching the engineering fabric to structures or pipes shall be submitted for review 30 days prior to start of placement.

SD-13 Certificates

Engineering Fabric; FIO.

The Contractor shall submit in triplicate, a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the engineering fabric. Certificates shall identify the engineering fabric being furnished by roll identification number. Certificates of compliance attesting that the materials meet specification requirements shall be submitted in accordance with Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph CERTIFICATES OF COMPLIANCE.

SD-14 Samples

Fabric; FIO. Seams; FIO.

Samples of engineering fabric shall be submitted for testing 14 days prior to the beginning of installation of the engineering fabric. Actual field sewn seam samples shall be submitted for testing 14 days prior to the beginning of installation of the engineering fabric. The sample average test results (weaker principle direction for mechanical tests) for a particular property for any individual roll tested within a lot shall meet or exceed the Minimum Average Roll Value (MARV) indicated in the manufacturer's certification.

1.3 IDENTIFICATION, STORAGE, AND HANDLING

The geotextile shall be identified, stored, and handled in accordance with ASTM D 4873.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Fabric

The engineering fabric shall be a nonwoven geotextile, as defined by ASTM D 4439, consisting of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, ethylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic if necessary to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The nonwoven engineering fabric shall conform to the physical property requirements tests in TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS, paragraph ACCEPTANCE REQUIREMENTS. The fabric rolls (strips) shall be manufactured in a minimum width of 3.7 m.

2.1.2 Seams

The seams of the engineering fabric shall be sewn with thread of a material meeting the chemical requirements given above for the engineering fabric. The contractor has the option of field sewing the sheets together to eliminate the overlapping of the sheets during field installation. The field seams shall be double sewn. Seams shall be tested in accordance with method ASTM D 4884. The strengths of the seam shall be not less than 80 percent of the required tensile strength (TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS) of the unaged fabric in any principal direction. Fabric and seams shall be aligned as specified in paragraph INSTALLATION OF ENGINEERING FABRIC.

2.1.3 Temporary Securing Pins

Temporary securing pins shall not be used.

2.1.4 Straps and Anchorage Material

The straps and anchorage material used to attach the engineering fabric to structures or pipes shall be stainless steel.

2.1.5 Anchor Trench Backfill

Anchor trench backfill shall be pervious material such as sands or gravels (SP, SW, GW, or GP) classified in accordance with ASTM D 2487.

2.2 ACCEPTANCE REQUIREMENTS

All brands of engineering fabric and all seams, except field sewn seams, will be accepted on the following basis.

2.2.1 Testing

If requested, government personnel shall collect engineering fabric samples in accordance with ASTM D 4354 for testing to determine compliance with any or all of the requirements in this specification pursuant to ASTM D 4759 and the following table:

TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS
Minimum Average Roll Values (MARV)

PHYSICAL PROPERTY	GRADE 2	TEST PROCEDURE
Tensile Strength +(unaged fabric)	1.07 kN Minimum	ASTM D 4632
Elongation	25 percent Minimum	ASTM D 4632
Puncture Strength +(unaged fabric)	0.51 kN Minimum	ASTM D 4833
Trapezoid Tear	0.40 kN Minimum	ASTM D 4533
Permittivity	Greater than 0.7 per sec.	ASTM D 4491
Apparent Opening Size	Less than 70 sieve (less than 0.212mm)	ASTM D 4751

TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS
Minimum Average Roll Values (MARV)

PHYSICAL PROPERTY	GRADE 2	TEST PROCEDURE
Ultraviolet Resistance	70 percent Minimum	ASTM D 4355 (percent of strength retained after 500 hours)

+ Unaged fabric is defined as fabric in the condition received from the manufacturer or distributor.

2.2.2 Mill Certificates or Affidavits

The mill certificates or affidavits for engineering fabric shall attest that the fabric and factory seams meet chemical, physical, and manufacturing requirements stated in this specification. The mill certificates or affidavits shall specify the actual Minimum Average Roll Values (MARV) and shall identify the fabric supplied by manufacturer's name and roll identification numbers.

PART 3 EXECUTION

3.1 INSTALLATION OF ENGINEERING FABRIC

3.1.1 Installation: General

The engineering fabric shall be placed in the manner and at the locations shown. At the time of installation, fabric shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage. The surface to receive engineering fabric shall be relatively smooth and free of obstructions, depressions, debris, and soft or low density pockets of material. The fabric shall be placed with the long dimension (machine direction) of the engineering fabric parallel to the centerline of the channel and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. The panels (sheets or strips) shall be placed to provide a minimum overlap width of 600 mm after placement of the riprap for each joint with the upstream panel overlapping the downstream panel and with the panels placed on channel slopes with the upper panel overlapping the next lower panel. Weights (Riprap) shall be used to temporarily hold the fabric in such a manner as to prevent the wind or other disturbance from lifting the fabric or shifting the overlap. The perimeter of the engineering fabric shall be anchored into the foundation with a trench or attached to the structure. When the engineering fabric is penetrated by pipes, the engineering fabric shall be attached to the pipe with straps. The trench at the top of the slope shall not be backfilled until the riprap is in place on the fabric. Anchor trench backfill shall be used to anchor the engineering fabric in the trench. The fabric shall be protected at all times during construction from contamination by surface runoff and fabric so contaminated shall be removed and replaced with uncontaminated fabric at no cost to the Government. Wheeled and/or tracked vehicles used in the placement of riprap are not allowed directly onto fabric and shall be of such design that they will not damage the underlying engineering fabric. Any fabric damaged during its installation or during placement of riprap shall be replaced by the Contractor at no cost to the Government. The work shall be scheduled so that the covering of the fabric with a layer of the specified

material is accomplished within 10 days after placement of the fabric. Failure to comply shall require replacement of the engineering fabric at no additional cost to the Government. The engineering fabric shall be protected from damage due to the placement of riprap or other materials by limiting the height of drop of the material to 1 meter. Before placement of riprap, the Contractor shall demonstrate that the placement technique will prevent damage to the fabric.

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SECTION 02220

MISCELLANEOUS ITEMS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 347R (1994) Guide to Formwork for Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 121 (1992a) Zinc-Coated (Galvanized) Steel Barbed Wire

ASTM A 123/A 123M (1997a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM C 94 (1998) Ready-Mixed Concrete

ASTM D 1785 (1996a) Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

ASTM D 2487 (1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.2 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Erosion Control Matting; FIO.

The Contractor shall submit signed copies of invoices from suppliers which show quantities and identify the material and manufacturer.

SD-08 Statements

Concrete Mixture Proportions; FIO.

Concrete mixture proportions shall be the responsibility of the Contractor and shall be designed in accordance with the criteria in paragraph CONCRETE MIXTURE. Ten days prior to placement of concrete, the Contractor shall submit the mixture proportions that will produce concrete of the qualities required. Mixture proportions shall include the dry weights of

cementitious material(s); the nominal maximum size of the coarse aggregate; the specific gravities, absorptions, and saturated surface-dry weights of fine and coarse aggregates; the quantities, types, and names of admixtures; and quantity of water per cubic meter of concrete. All materials included in the mixture proportions shall be of the same type and from the same source as will be used on the project.

SD-13 Certificates

Guy Anchors; FIO. Anchor Rod; FIO. Barbed Wire; FIO.

Certificates of compliance attesting that the materials meet specification requirements shall be submitted in accordance with Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph CERTIFICATES OF COMPLIANCE.

1.3 REGULATORY REQUIREMENTS

The regulatory requirements listed below form a part of this specification to the extent referenced. The regulatory requirements are referred to in the text by basic designation only.

MISSISSIPPI STATE HIGHWAY DEPARTMENT (MS SHD)

MS SHD-01	(1990; Supple 1991) Standard Specifications for Roads and Bridge Construction
Section	Title
701	Hydraulic Cement
703.02.2.2	Aggregates. Fine Aggregate for Portland Cement Concrete. Detail Requirements Gradation Requirements
713.02	Concrete Curing Materials and Admixtures Admixtures for Concrete
714.01.1	Miscellaneous Material. Water. General

1.4 MISCELLANEOUS ITEMS

The Contractor shall furnish all plant, labor, materials, and equipment and install the following items:

- a. Concrete Work
- b. Pipe Anchors
- c. Seepage Collar
- d. Erosion Control Matting
- e. Annular Filter Drainage Ring
- f. Riser Fence
- g. Grouted Riprap Conduit Cradle

h. Filter Drainage Diaphragm

1.5 MANUFACTURERS' NAMES AND IDENTIFICATION NUMBERS

Manufacturers' names and identification numbers are listed as a means of establishing a standard of type, function, and quality only, and shall not be construed as restrictive or proprietary. Similar items by other reputable manufacturers will be acceptable provided it is determined, to the satisfaction of the Contracting Officer, to be equal and comparable in all respects to the item specified. All items shall be the latest manufacturer's catalog descriptions. Item numbers stated have been selected from catalogs designated by the manufacturers as current. In the event similar items by other manufacturers are proposed for use, equipment by manufacturer's item, as well as catalog data of the item proposed for use, shall be submitted for approval in order that a proper comparison can be made.

1.6 EXCAVATION AND BACKFILL

Excavation and backfill shall be as specified in Section 02226 EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER.

1.7 CONCRETE

1.7.1 General

Concrete work shall be as specified and as shown.

1.7.2 Concrete Mixture

Concrete shall meet the requirements of ASTM C 94. The concrete shall be in accordance with paragraph 5, Option A. The compressive strength shall be 20,685 kPa. The maximum nominal size coarse aggregate shall be 19 mm. The air content shall be between 4.5 and 7.5 percent. The slump shall be between 25 and 100 mm. Certified strength requirements will be used in lieu of the requirements specified in paragraph 17 of ASTM C 94.

1.7.3 Finishes

A Class "C" finish shall apply to all surfaces except those specified to receive a Class "D" finish. A Class "D" finish shall apply to all surfaces which will be permanently concealed after construction. The surface requirements for the classes of finish required shall be as specified in ACI 347R.

PART 2 PRODUCTS

2.1 CONCRETE WORK

Concrete work for riser foundation slabs and top slabs at the riser inlets shall be as specified and as shown.

2.2 PIPE ANCHOR MATERIALS

2.2.1 Guy Anchors

Guy anchors shall be double helix anchor assembly, consisting of a helix-hub assembly, anchor rod, and eyenut.

2.2.2 Metal Bands and Angles

The flat metal band and angles shall be fabricated of commercial quality structural steel and shall be galvanized after fabrication in accordance with the requirements of ASTM A 123/A 123M. The flat metal band shall be fabricated of 12 gage steel and welded to angle as shown.

2.2.3 Welding

All welding shall be in accordance with Section 05056 WELDING. All welds and all exposed metal shall be prepared as specified in Section 02719 CORRUGATED METAL PIPE paragraph TOUCH-UP.

2.3 SEEPAGE COLLAR MATERIALS

2.3.1 Corrugated Metal

The corrugated metal for the seepage collar shall meet the requirements of Section 02719 CORRUGATED METAL PIPE.

2.3.2 Miscellaneous Metal Components

Sheet metal band, tank type lugs, rods, bolts and washers, as shown, shall be fabricated of commercial quality structural steel and shall be galvanized after fabrication in accordance with the requirements of ASTM A 123/A 123M.

2.3.3 Welding

All welding shall be in accordance with Section 05056 WELDING. All welds and all exposed metal shall be prepared as specified in Section 02719 CORRUGATED METAL PIPE, paragraph TOUCH-UP.

2.3.4 Mastic

Mastic shall be as recommended by the pipe manufacturer.

2.4 EROSION CONTROL MATTING MATERIALS

2.4.1 General

The erosion control matting shall be a nominal 9.5 mm (3/8 inch) thick blanket of excelsior wheat straw or other natural fiber bonded to a photodegradable mesh. The mats shall be rated by the manufacturer for use in vegetated channels having flow velocities of up to 1.5 meters per second.

2.4.2 Backfill for Transverse Trenches

Backfill in transverse trenches for anchoring erosion control matting shall be as specified in Section 02226 EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER, paragraph SUITABLE MATERIAL.

2.4.3 Anchors

Anchors for erosion control matting shall be installed in accordance with the manufacturer's recommendations.

2.5 ANNULAR FILTER DRAINAGE RING MATERIALS

Filter material shall be sand furnished by the Contractor from off site borrow areas that have been approved by the Mississippi Department of Transportation for use as fine aggregate in portland cement concrete. The sand shall be a clean, free draining sand in accordance with classification SP in ASTM D 2487. Certification of the gradation of filter material will be required by the Contractor. The Contracting Officer may spot check material gradation for compliance.

2.6 RISER FENCE MATERIALS

2.6.1 Barbed Wire

Barbed wire shall be zinc-coated steel barbed wire conforming to ASTM A 121 Standard Grade, Class 1 coating, gage and barbs as indicated on the drawings.

2.6.2 Wooden Posts

Line posts, corner posts, brace posts, and horizontal braces shall be standard pressure treated commercially available creosoted posts or wood treated with chromated copper arsenate of the dimensions indicated on the drawings.

2.7 GROUTED RIPRAP CONDUIT CRADLE MATERIALS

2.7.1 Grout Mixture

The grout shall consist of a mixture of (by volume):

MIXTURE	MS SHD-01 REQUIREMENTS
1 part portland cement	701
3 parts fine aggregate	703.02.2.2
Four to seven gallons of water per bag of cement	714.01.1
Air-entraining admixture, 5 to 7 percent	713.02

The materials used in the grout shall meet the respective requirements of MS SHD-01.

2.7.2 Riprap

Riprap for conduit cradle shall meet the requirements of Section 02542 STONE PROTECTION.

2.8 FILTER DRAINAGE DIAPHRAGM MATERIALS

2.8.1 Filter Material

Filter material shall be sand furnished by the Contractor from off site borrow areas that have been approved by the Mississippi Department of Transportation for use as fine aggregate in portland cement concrete. The sand shall be a clean, free draining sand in accordance with classification SP in ASTM D 2487. Certification of the gradation of filter material will be required by the Contracting Officer. The Contracting Officer may spot check material gradation for compliance.

2.8.2 Fittings and Pipe

The fittings and pipe used to form the drain outlet including the

non-perforated pipe and fittings shall be PVC plastic pipe, Schedule 40, in accordance with ASTM D 1785. All fittings and connections shall be solvent welded to form a strong watertight connection.

2.8.3 PVC Well Screen

The PVC well screen shall be continuous wire wrapped perforated PVC plastic pipe, Schedule 40, in accordance with ASTM D 1785, or approved equal. The pipe shall have a nominal diameter of 100 mm. The ends of PVC well screen shall be capped and all fittings and connections solvent welded to form a strong watertight connection. The wire shall be keystone shaped. The total open area per meter of well screen shall not be less than 21,165 square millimeters and not greater than 31,750 square millimeters. The well screen shall be number 10 slot (0.25 mm)

2.8.4 Animal Guard

A small animal guard shall be brass or bronze bars installed in accordance with the details shown.

PART 3 EXECUTION

3.1 INSTALLATION OF MISCELLANEOUS ITEMS

Each miscellaneous item shall be installed complete in place and in accordance with the drawings and specifications.

3.2 PIPE ANCHORS

Pipe anchors shall be installed as shown.

3.3 SEEPAGE COLLAR

The seepage collar shall be installed as shown. Fill adjacent to the seepage collar shall be hand compacted with approved vibratory hand compaction equipment as specified in Section 02226 EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER, paragraph COMPACTION, subparagraph PIPE BACKFILL.

3.4 ANNULAR FILTER DRAINAGE RING

The annular filter drainage ring shall be installed as shown. The annular filter drainage ring around the corrugated metal pipe shall be placed in layers not exceeding 100 mm in thickness and compacted by approved hand compaction equipment in such a manner that each layer receives three (3) complete coverages of the surface. Moisture control shall be in accordance with Section 02226 EXCAVATION, BACKFILL, EMBANKMENT, AND CONTROL OF WATER, paragraph MOISTURE CONTROL.

3.5 RISER FENCING

3.5.1 General

The fence shall be installed on the previously prepared surfaces to line and grade indicated. Stock tight fence installation shall be as shown and in accordance with the fence manufacturer's written installation instructions unless otherwise specified.

3.5.2 Excavation

Excavation shall be of the minimum dimensions required and indicated. Postholes shall be cleared of loose materials. Waste material shall be spread where directed.

3.5.3 Post Setting

Post shall be set plumb at the locations shown on the drawings. Posts shall be set in dug holes of dimensions required.

3.5.4 Barbed Wire

Barbed wire shall be installed on the fence posts as shown. Each strand (three strands required) shall be pulled taut and securely fastened to each post and extended member. The method of securing wires shall be positive and complete. Barbed wire shall be attached to wooden posts with galvanized fence staples. Staples shall be 9-gauge, 38 mm long minimum.

3.6 GROUTED RIPRAP CONDUIT CRADLE

The grouted riprap conduit cradle shall be as specified and shown. The grout shall be placed by slushing into riprap by hand or other manual methods to provide a smooth bedding surface for the pipe.

3.7 EROSION CONTROL MATTING AND SODDING

3.7.1 Erosion Control Matting

The erosion control matting shall be installed as shown. Trenches shall be constructed as shown for anchoring erosion control matting. Prior to placing the matting, the ground shall be graded to cross section shown with a maximum deviation of plus 50 mm. Edges and overlaps of the material shall be staked at 3.6 meter intervals unless otherwise shown. Erosion control matting shall be staked in trenches as shown.

3.8 FILTER DRAINAGE DIAPHRAGM

The Contractor shall furnish and install all drain fill materials for the annular filter drainage diaphragm as shown. The filter drainage diaphragm shall be placed in layers not exceeding 100 mm in thickness and compacted approved hand compaction equipment in such a manner that each layer receives three (3) complete coverages of the surface.

3.9 CONCRETE RISER FOUNDATION AND TOP SLAB

3.9.1 Formwork Installation

Forms shall be properly aligned, adequately supported, and mortar-tight. The form surfaces shall be smooth, free from irregularities, dents, sags, or holes when used for permanently exposed faces. All exposed joints and edges shall be chamfered, unless otherwise indicated.

3.9.2 Concrete Placement

Unless otherwise approved, concrete placement will not be permitted when weather conditions prevent proper placement. The concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours or 45 minutes when the placing temperature is 29.5 degrees C or greater unless a retarding admixture is used. Concrete shall be conveyed

from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. Concrete shall be deposited as close as possible to its final position in the form. No concrete placement shall be made when the ambient temperature is below 4.5 degrees C. Any concrete damaged by freezing shall be removed and replaced at the Contractor's expense. Each layer of concrete shall be consolidated by internal vibratory equipment. No concrete shall be dropped more than 1.5 meters.

3.9.3 Finishing

No finishing or repair shall be done when either the concrete or ambient temperature is below 4.5 degrees C.

3.9.4 Form Removal

Forms shall not be removed before the expiration of 24 hours after concrete placement, except where otherwise specifically authorized. Supporting forms and shoring shall not be removed until the concrete has cured for at least 5 days. When conditions on the work are such as to justify the requirement, forms will be required to remain in place for longer periods.

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SECTION 02226

EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 2487	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
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PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Fill, Backfill and Embankment

2.1.1.1 General

The Government makes no guarantee that the quantity of required excavation is adequate to provide the quantity of suitable material needed for required fill, backfill and embankment. Material for fill, backfill and embankment shall be obtained from required excavation and/or furnished by the Contractor from off-site sources at no additional cost to the Government. Material furnished by the Contractor shall be suitable material and shall be approved prior to being used. No frozen material shall be placed and material shall not be placed against frozen surfaces.

2.1.1.2 Suitable Materials

Suitable materials to be used for fill, backfill, transverse trenches for anchoring erosion control matting, impervious upstream blanket and embankment shall be clay (CL or CH) or silt (ML) classified in accordance with ASTM D 2487.

2.1.1.3 Unsuitable Materials

Materials which are classified as unsuitable for fill, backfill, impervious upstream blanket and embankment material are defined as masses of organic matter, sticks, branches, roots, trash and other debris.

2.1.1.4 Topsoil

Topsoil shall be obtained from required excavation or furnished by the Contractor from off-site sources and shall be materials suitable for treatment as specified in Section 02960 EROSION CONTROL.

PART 3 EXECUTION

3.1 EXCAVATION

3.1.1 General

Excavation shall consist of removal of material in preparing the foundation to the lines and grade shown. Wherever unsuitable foundation material is encountered, the unsuitable material shall be removed to the depth directed. Overexcavation will not be permitted except to remove unsuitable material as directed. Backfill of authorized (required) overexcavation and of unauthorized overexcavation shall be as specified in paragraph PLACEMENT, subparagraph BACKFILL and paragraph COMPACTION, subparagraph BACKFILL. Excavated materials shall be disposed of as specified in paragraph DISPOSAL OF EXCAVATED MATERIALS.

3.1.2 Excavation for Structures and Channels

The foundations for the structures, riprap and filters shall be excavated to the lines, grades and sections indicated. The channels at the end of pipes shall be excavated to the lines, grades and sections indicated within an allowable tolerance of plus or minus 150 mm. All foundations shall be solid, undisturbed or properly compacted material. The bottom of the excavation upon which concrete is to be placed shall be accurately finished to the dimensions prescribed or directed, within an allowable tolerance of plus 13 mm and minus 50 mm. Where disturbed by the Contractor's operations and elsewhere as required, the excavated surfaces shall be moistened with water or dried as necessary and tamped or rolled with suitable tools or equipment for the purpose of thoroughly compacting them and forming firm foundations upon or against which to place the concrete.

3.1.3 Emergency Spillways

- a. At sites where the emergency spillway is shown as a natural terrain feature, earthwork construction is not required and the natural terrain shall not be disturbed.
- b. At sites where construction is required, the emergency spillway shall be excavated to the lines and grades indicated, within an allowable tolerance of plus or minus 150 mm.

3.1.4 Disposal of Excavated Materials

Excavated materials which are not suitable for use as fill shall be disposed of by placing it in Contractor-furnished upland disposal area(s) outside the Government-furnished rights-of-way. The location and dimensions of the Contractor-furnished disposal area(s) shall be approved prior to disposal of any material and shall not be located in any river, stream, lake or wetland area. The Contractor shall obtain the rights-of-way for the disposal area(s) in accordance with Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph RIGHTS-OF-WAY. No separate payment will be made for Contractor-furnished disposal area(s).

3.1.4.1 Disposal of Discarded Materials

Discarded material other than those which can be included in the solid waste category shall be disposed of as specified in paragraph EXCAVATION, subparagraph DISPOSAL OF EXCAVATED MATERIALS above.

3.1.5 Stockpiling of Material

Stockpiles of materials temporarily stored for later use shall be located in approved areas. Stockpiled material shall have a maximum height not to exceed 3 meters, shall have end and side slopes not steeper than 1V on 2H, and the surfaces of all stockpiles shall be sloped to drain readily and sealed by compacting. Excavation from stockpiles shall be made so as to maintain drainage at all times. No stockpiled material shall be placed within 15 meters of top bank of channel excavation or structure excavation. Excavated materials which are suitable for incorporation in the fill shall either be placed directly therein or stockpiled and subsequently used in the fill.

3.2 PLACEMENT

3.2.1 General

Fill shall consist of the placement of material in channel side slopes and any other area where filling is required to obtain the lines and grades above the existing ground surfaces as shown. The foundation surface and any concrete surfaces shall be suitably moistened prior to placement of fill against them. No fill shall be placed and compacted on top of concrete riser foundation slab for at least seven (7) days.

3.2.2 Foundation Preparation

Immediately prior to the placement of fill material, the entire surface on or against which fill is to be placed shall be thoroughly broken to a depth of 150 mm. If for any cause this broken surface or other surface that is to receive fill becomes compacted in such a manner that a plane of seepage or weakness might be induced, if directed, it shall again be thoroughly broken before the depositing of material thereon at no additional cost to the Government. The foundation receiving fill and all partially completed fill shall be kept thoroughly drained. No fill shall be placed on any part of the foundation until such areas have been inspected and approved.

3.2.3 Fill and Embankment

The materials shall be placed or spread in layers, the first layer not more than 150 mm in thickness and the succeeding layers not more than 300 mm in thickness prior to compaction. Layers shall slope to provide satisfactory drainage during construction. Benching into the slope of the existing embankment may be required in order to place and compact the material in horizontal layers. When the surface of any compacted layer is too smooth to bond properly with the succeeding layer, it shall be adequately scarified before the next layer is placed thereon.

3.2.4 Backfill

Backfill shall consist of the refill of excavation and holes to the existing ground surface or to the lines and grades shown, if below the existing ground surface, except for pipe backfill as specified in paragraph COMPACTION, subparagraph PIPE BACKFILL. Backfill material shall be deposited in 100 mm maximum thickness layers. No backfill shall be placed against slopes steeper than one (1) horizontal to one (1) vertical unless approved.

3.2.5 Impervious Upstream Blanket

Material for impervious upstream blankets shall be placed as specified in paragraph FILL AND EMBANKMENT.

3.2.6 Pipe Backfill

Backfill, except the annular filter drainage ring around the corrugated metal pipe, shall be placed in layers not exceeding 100 mm in thickness.

3.2.7 Topsoil

Topsoil shall be spread to a uniform thickness of 150 mm on areas that are lime treated prior to beginning erosion control operations specified in Section 02960 EROSION CONTROL.

3.3 COMPACTION

3.3.1 Fill and Embankment

Fill and embankment material shall be deposited in 300 mm maximum thickness layers and compacted by at least three passes of a bulldozer weighing at least 9,100 kilograms and exerting a tread pressure of at least 42 kPa. The bulldozer or crawler type tractor will not be considered to be compacting when spreading material, and shall be operated at speeds not to exceed 5.6 kilometers per hour when compacting. Fill shall be constructed to the lines and grades shown. A tolerance of plus or minus 50 mm will be permitted in the final dressing provided there are no abrupt humps or depressions in surfaces, the slopes are uniform, and the fill is shaped to drain.

3.3.2 Backfill

Backfill material shall be compacted with suitable tampers to at least the density of the adjacent undisturbed soil. A tolerance of plus or minus 50 mm will be permitted in the final dressing.

3.3.3 Impervious Upstream Blanket

The impervious upstream blanket shall be compacted as specified in paragraph FILL AND EMBANKMENT.

3.3.4 Pipe Backfill

Backfill around the corrugated metal pipe shall be hand compacted from the circumference of the pipe to a distance of at least one (1) meter from the pipe. Backfill shall be compacted by application of a motor driven hand tamper or other approved hand compaction equipment over the backfill in such a manner that every point of the surface of each layer of fill shall be compacted by the hand tamper to a density equal to the adjacent undisturbed soil. The pipe shall be held securely in place at all times while tamping is being performed to ensure proper bond between the pipe and the ground.

3.3.5 Topsoil

Compaction is not required for topsoil.

3.3.6 Definition of a Pass

A pass shall consist of one complete coverage of the surface of a layer by the treads of the roller, tractor or other compacting equipment. Portions of the fill or backfill which the compacting equipment cannot reach for any

reason shall be compacted by an approved method to the density at least equal to that of the surrounding fill or backfill.

3.3.7 Additional Compaction

If the desired compaction of any portion of the fill or backfill is not secured by the minimum number of passes specified, additional complete passes may be directed over the surface area of such designated portion and an equitable adjustment in the contract price and time will be made in accordance with the Contract Clause CHANGES.

3.4 MOISTURE CONTROL

3.4.1 Fill and Embankment

Fill material shall be placed at its natural moisture content. No moisture control will be required by the Contractor unless the desired compaction is not being obtained due to the material being too wet or too dry. In such cases, the Contractor will be directed to perform moisture control as prescribed below. If the material is too wet, it shall either be stockpiled and allowed to drain before it is placed or the wet material shall be processed by disking and harrowing, if necessary, until the moisture content is reduced sufficiently. If the material is too dry, it shall either be prewet in the borrow area or sufficient moisture shall be uniformly distributed in each layer before compaction. If the Contractor is directed to perform any moisture control as outlined in this paragraph, an equitable adjustment in the contract price and time will be made in accordance with the Contract Clause CHANGES.

3.4.2 Backfill

Moisture control for backfill shall be as specified in paragraph MOISTURE CONTROL, subparagraph FILL AND EMBANKMENT.

3.4.3 Impervious Upstream Blanket

Moisture control for impervious upstream blanket shall be as specified in paragraph MOISTURE CONTROL, subparagraph FILL AND EMBANKMENT.

3.4.4 Pipe Backfill

Moisture control for pipe backfill shall be as specified in paragraph MOISTURE CONTROL, subparagraph FILL AND EMBANKMENT.

3.4.5 Topsoil

Moisture control for top soil is not required.

3.5 SLIDES

In case sliding occurs in any part of the prescribed excavation for the inlet or outlet channel during construction or after completion but prior to acceptance, the Contractor shall remove and repair such portions of the slides as directed. In case the slide is caused through fault or negligence of the Contractor, the slide shall be removed and repaired without cost to the Government. In case the slide is not caused through fault or negligence of the Contractor, an equitable adjustment pursuant to the Contract Clause CHANGES will be made for removing and repairing the slide.

3.6 DIVERSIONS

Suitable material excavated from the swale shall be used in the embankment portion of the diversion supplemented with such borrow material as may be required. The diversion shall be constructed to the lines and grades shown with the swale graded to drain in the direction shown. The embankment portion of the diversion shall be constructed in conformance with the requirements for fill and embankment in paragraph PLACEMENT and paragraph COMPACTION. The swale portion of the diversion shall be constructed in conformance with paragraph EXCAVATION.

3.7 CONTROL OF WATER

3.7.1 Stream Description

The project sites are adjacent to hill streams and connecting ditches. During periods of rainfall, the streams can be subject to a fast rise and fall. No hydraulic or hydrologic data has been measured to date.

3.7.2 Contract Requirements

The Contractor shall take such action as necessary to reroute normal flow through the work sites. The Contractor shall construct such ditches, dikes, collectors, drains and sumps as may be required to collect the water within the work area, regardless of its source (this includes ground subsurface water bleeding into the excavation), and shall provide and operate pumps and discharge lines adequate for disposing of the collected water at a point or points outside the work area. When the rerouting, collection and disposal system, or a portion thereof, is no longer needed, it shall be removed. No separate measurement or payment will be made for control of water.

-- End of Section --

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SECTION 02542

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SECTION 02542

STONE PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 127 (1988; R 1993) Specific Gravity and Absorption of Coarse Aggregate

ASTM C 295 (1990) Petrographic Examination of Aggregates for Concrete

CORPS OF ENGINEERS (COE)

COE CRD-C 144 (1973) Testing Stone for Resistance to Freezing and Thawing

COE CRD-C 169 (1993) Resistance of Rock to Wetting and Drying

1.2 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-09 Reports

Gradation Test; FIO. Evaluation Tests; FIO.

The gradation tests shall be submitted using the GRADATION TEST DATA SHEET enclosed at end of this section.

Quality test on the stone in accordance with paragraph EVALUATION TESTING shall be the responsibility of the Contractor and submitted for approval prior to delivery of such material to the worksite.

SD-13 Certificates

Stone; FIO. Laboratory; FIO.

Certificates of compliance attesting that the materials meet specification requirements shall be submitted to the Contracting Officer.

A copy of the testing laboratory's certification and inspection report shall be submitted along with actions taken to correct deficiencies.

1.3 GOVERNMENT TESTING AND STUDIES

1.3.1 Stone

1.3.1.1 General

All stone shall be durable material as approved by the Contracting Officer. In case an unlisted source is to be used, the Contractor shall show that an adequate quantity of material is available and provide quality test data. Stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, seams and other defects that would tend unduly to increase its deterioration from natural causes. The stone shall be clean and reasonably free from earth and dust and shall contain no refuse.

1.3.1.2 Sources

Stone shall be furnished from any of the sources listed at the end of this section, or at the option of the Contractor may be furnished from any other source designated by the Contractor and accepted by the Contracting Officer, subject to the conditions herein stated. If the Contractor proposes to furnish riprap from a source not currently listed at the end of this section, the Government will conduct a quarry investigation and evaluate the quality test data provided by the Contractor to determine whether acceptable stone can be produced from the proposed source. Satisfactory service records on other work may be acceptable. In order for stone to be acceptable on the basis of service records, stone of a similar size must have been placed in a similar thickness and exposed to weathering under similar conditions as are anticipated for this contract, and must have satisfactorily withstood such weathering for a minimum of 20 years.

a. List of Sources. On the basis of information and data available to the Contracting Officer, stone meeting the quality requirements of these specifications has been produced from the sources listed at the end of this section.

b. Selection of Source. The Contractor shall designate in writing only one source or one combination of sources from which he proposes to furnish stone. If the Contractor proposes to furnish stone from a source not listed at the end of this section, he may designate only a single unlisted source for stone and he shall notify the Contracting Officer at least 60 workdays before the stone leaves the quarry. It is the Contractor's responsibility to determine that the stone source or combination of sources selected is capable of supplying the quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work. Samples for acceptance testing shall be provided in accordance with paragraph EVALUATION TESTING. If a source for stone so designated by the Contractor is not accepted for use by the Contracting Officer, the Contractor may not propose other sources but shall furnish the stone from a source listed at the end of this section at no additional cost to the government.

c. Acceptance of Materials. Acceptance of a source of stone is not to be construed as acceptance of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for stone as determined by the Contracting Officer. Materials produced from a listed or unlisted source shall meet all the requirements herein.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Engineering Fabric

Engineering fabric shall be as specified in Section 02213 ENGINEERING FABRIC.

2.1.2 Riprap

2.1.2.1 General

Riprap shall be placed within the limits shown. Only quarried stone shall be used. Riprap quality shall be as specified in paragraph GOVERNMENT TESTING AND STUDIES, subparagraph STONE. Gradation shall conform to the table(s) below and to the plate(s) attached at the end of this section. A maximum of 10 percent flat and elongated pieces will be acceptable. A flat and elongated piece of riprap is defined as a stone with either the width or thickness of the piece being less than one-third of the length.

TABLE I
(FOR RIPRAP "M90")

PERCENT LIGHTER BY WEIGHT (SSD)	LIMITS OF STONE WEIGHT, kg
100	90 - 35
50	40 - 20
15	20 - 5

2.1.3 Evaluation Testing

If the Contractor proposes to furnish stone from an unlisted source, the Contractor shall have evaluation tests performed on stone samples collected from the proposed source. The tests to which the stone shall be subjected include petrographic examination (ASTM C 295), specific gravity, unit weight, and absorption (ASTM C 127), resistance of stone to freezing and thawing (COE CRD-C 144), and if sandstone is used, resistance to wetting and drying in accordance with (COE CRD-C 169).

a. Unit Weight and/or Absorption. Stone shall weigh more than 2,480 kg/cubic meter. The stone shall have an absorption less than 2 percent unless other tests and service records show that the stone is satisfactory. The method of test for unit weight and absorption will be ASTM C 127, except the unit weight will be calculated in accordance with Note No. 5 using bulk specific gravity, saturated surface dry.

b. Resistance to Freezing and Thawing. Stone when tested in accordance with COE CRD-C 144 shall have a loss of less than 5 percent.

c. Resistance to Wetting and Drying. This test shall only be required to be performed on sandstone samples. When tested in accordance with COE CRD-C 169 (35 cycles), there shall be a loss of less than one percent.

d. Samples. Samples of stone from a source not listed at the end of this section shall be taken by a representative of the Quarry under the

supervision of the Contracting Officer for testing and acceptance prior to delivery of any stone from this source to the site of the work. Samples shall consist of at least three pieces of stone, roughly cubical in shape and weighing not less than 34 kgeach. The samples shall be shipped at the Contractor's expense to a laboratory certified by the government to perform the required tests.

e. Tests. The tests shall be conducted by the Contractor in accordance with applicable Corps of Engineers methods of tests given in the Handbook for Concrete and Cement, and shall be performed at a laboratory certified by the government. The cost of testing shall be borne by the Contractor.

2.1.4 Gradation Test

The Contractor shall perform a gradation test or tests on the riprap at the quarry in accordance with paragraph STANDARD TEST METHOD FOR GRADATION OF RIPRAP AND GRADED STONE. The sample shall be taken by the Contractor in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer not less than 3 days in advance of each test. In the event of unavailability of a Government representative; the Contractor shall perform the tests and certify to the Contracting Officer that the riprap shipped complies with the specifications. At least one gradation test(s) shall be performed per 45,000 tons (metric) of each size of riprap placed, but not less than one test shall be performed. The gradation tests shall be reported using the forms, GRADATION TEST DATA SHEET and ENG FORM 4794-R, attached at end of this section. The Contractor shall designate on the test form that portion in tons (metric) of the lot tested which is applicable to this contract. Any deviation from the reported tonnage shall be corrected and recorded on a revised GRADATION TEST DATA SHEET. The sample shall consist of not less than 15 tons (metric) of M90 riprap, and shall be collected in a random manner which will provide a sample which accurately reflects the actual gradation arriving at the jobsite. Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarry process, and all stone represented by the failed tests shall be set aside and not incorporated into the work. Any additional tests required because of the failure of an initial test sample will not be considered as one of the other required tests. If collected by the truckload, each truckload shall be representative of the gradation requirements. The Contracting Officer may direct additional testing of the stone at the project site if the stone appears by visual inspection, to be out of gradation. The Contracting Officer may direct this testing under the Contract Clause INSPECTION OF CONSTRUCTION. The Contractor shall provide all necessary screens, scales and other equipment, the operating personnel, and shall grade the sample. Certification and test results shall represent stone shipped from the quarry. Certification and tests results must be received by the Contracting Officer at the jobsite before the riprap is used in the work.

2.1.5 Stockpile

Temporary storage of stone at the worksite is not to be confused with off-site stockpiling of stone. If the Contractor elects to provide off-site stockpiling areas, the Contracting Officer shall be notified by the Contractor of all such areas.

2.1.6 Worksite Stockpile

Stone delivered to the work sites, which requires temporary storage

landward of top bank, shall be placed in a container suitable for storing the riprap without waste, or a sand-clay-gravel pad may be constructed for the storage area and removed upon completion of the work. If the sand-clay-gravel pad method is used, the pad shall have a minimum thickness of at least 150 mm. The container or sand-clay-gravel pad method shall be subject to approval prior to delivery of the stone. Upon completion of the work, the storage areas shall be cleaned of all storage residues and returned to their natural condition. Temporary storage of stone at the worksite will be allowed, provided the stream-side toe of the stone be no closer than 15 meters from the closest edge of the stream's top bank, and the amount shall not exceed 200 tons (metric) unless otherwise approved. The Contractor's jobsite stockpile shall be a maximum of 3.6 meters high and formed by a series of layers of truckload dumps, where the rock essentially remains where it is placed. Subsequent layers shall be started 3 m from the edge of the previous layer so that the rock will not roll down the edges of the previous layers. The first layer shall be a maximum of 2 m high. Any stone which has become contaminated with soil, dirt, or refuse after being stockpiled, will not be put into the work unless the contaminating material has been removed from the stone prior to placement.

2.1.7 Off-site Stockpile

The Contractor's off-site stone stockpile shall be a maximum of 3.6 meters high and formed by a series of layers of truckload dumps, where the rock essentially remains where it is placed. Subsequent layers shall be started 3 meters from the edge of the previous layer so that the rock will not roll down the edges of the previous layers. The first layer shall be a maximum of 2 meters high. Any riprap which has become contaminated with soil, dirt, or refuse after being stockpiled, will not be put into the work unless the contaminating material has been removed from the riprap prior to placement. In areas where stone is stockpiled for placement, the area shall have excess rock removed prior to completion of work. All rock and spalls greater than 75 mm in diameter shall be removed. Where rocks may have become buried due to soft ground or operation of the equipment, the rock shall be disposed of as directed. After the rock has been removed, the storage area shall be graded, dressed, and filled to return the ground surface as near as practical to the condition that existed prior to construction.

PART 3 EXECUTION

3.1 BASE PREPARATION

Areas on which engineering fabric and riprap are to be placed shall be graded and/or dressed to conform to cross sections shown on the contract drawings within an allowable tolerance of plus 50 mm and minus 100 mm from the theoretical lines and grades. The prepared base shall be approved by the Contracting Officer. Where such areas are below the allowable minus tolerance limit they shall be brought to grade by fill with earth similar to the adjacent material and then compacted to a density equal to the adjacent in place material. Immediately prior to placing the engineering fabric the prepared base will be inspected by the Contracting Officer and no material shall be placed thereon until that area has been approved.

3.2 PLACEMENT OF FILTER LAYERS

3.2.1 General

A filter layer composed of engineering fabric shall be placed on the

prepared base as described below, in accordance with the details shown on the contract drawings, and within the limits either shown on the contract drawings or staked in the field, to form a backing for the stone protection.

3.2.2 Engineering Fabric

Installation of engineering fabric shall be as specified in Section 02213 ENGINEERING FABRIC. Any damage to the surface of the engineering fabric during placement of stone shall be repaired before proceeding with the work.

3.3 PLACEMENT OF RIPRAP

3.3.1 General

Riprap shall be placed on the engineering fabric as specified in paragraph ENGINEERING FABRIC within the limits shown.

3.3.2 Placement

Stone for riprap shall be placed in a manner which will produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids, and shall be constructed, within the specified tolerance, to the lines and grades either shown on the contract drawings or staked in the field. A tolerance of plus 100 mm and minus 50 mm from the lines and grades shown on the contract drawings will be allowed in the finished surface of the riprap, except that the extreme of this tolerance shall not be continuous over an area greater than 18 square meters. No stone shall be dropped through air from a height greater than 1 meter. The large stones shall be well distributed and the entire mass of stones in their final position shall be graded to conform to the gradation specified in paragraph RIPRAP, subparagraph GENERAL. The finished riprap shall be free from objectionable pockets of small stones and clusters of larger stones. Placing riprap in layers will not be permitted. Placing riprap by dumping it into chutes, or by similar methods likely to cause segregation of the various sizes, will not be permitted. Placing riprap by dumping it at the top of the slope and pushing it down the slope will not be permitted. No equipment shall be operated directly on the completed riprap protection system. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry or other source by controlled dumping of successive loads during final placing or by other methods of placement which will produce the specified results. Each truckload shall be representative of the gradation requirements. All dump trucks used in placing the riprap shall be equipped with bottom hinged tailgates. The gate releasing mechanism shall be arranged so that it may be operated only from, at, or near the front of the truck. Rearranging of individual stones will be required to the extent necessary to obtain a reasonably well-graded distribution of stone sizes as specified above. The Contractor shall maintain the riprap protection until accepted by the Contracting Officer and any material displaced prior to acceptance and due to the Contractor's negligence shall be replaced at his expense and to the lines and grades shown on the contract drawings.

3.4 TESTS

3.4.1 General

The Contractor shall perform gradation tests to assure compliance with contract requirements and shall maintain detailed records.

3.4.2 Reporting

Reporting shall be in accordance with paragraph GRADATION TEST.

3.4.3 Standard Test Method for Gradation of Riprap and Graded Stone

- a. Select a representative sample (Note No. 1), weigh and dump on hard stand.
- b. Select specific sizes (see example) on which to run "individual weight larger than" test. (See Note No. 2). Procedure is similar to the standard aggregate gradation test for "individual weight retained".
- c. Determine the largest size stone in the sample. (100 percent size)
- d. Separate by "size larger than" the selected weights, starting with the larger sizes. Use reference stones, with identified weights, for visual comparison in separating the obviously "larger than" stones. Stones that appear close to the specific weight must be individually weighed to determine size grouping. Weight each size group, either individually or cumulatively.
- e. Paragraph d above will result in "individual weight retained" figures. Calculate individual percent retained (heavier than) cumulative percent retained and cumulative percent passing (lighter than). Plot percent passing, along with the specification curve on ENG Form 4794-R.

NOTE NO. 1: Sample Selection: The most important part of the test and the least precise is the select representative sample. No "standard" can be devised; larger quarry run stone is best sampled at the shot or stockpile by given direction to the loader; small graded stone is best sampled by random selection from the transporting vehicles. If possible, all parties should take part in the sample selection, and agree before the sample is run, that the sample is representative.

NOTE NO. 2: Selection of Size for Separation: It is quite possible and accurate to run a gradation using any convenient sizes for the separation, without reference to the specifications. After the test is plotted on a curve, then the gradation limits may be plotted. Overlapping gradations with this method are no problem. It is usually more convenient, however, to select points from the gradation limits, such as the minimum 50 percent size, the minimum 15 percent size, and one or two others, as separation points.

**EXAMPLE GRADATION
SPECIFICATIONS**

STONE WEIGHT IN KG	PERCENT LIGHTER BY WEIGHT
180-75	100
75-35	50
35-15	15

EXAMPLE WORKSHEET

STONE SIZE KG	INDIVIDUAL WT. RETAINED	INDIVIDUAL PERCENT RETAINED	CUMULATIVE PERCENT RETAINED	PERCENT PASSING
180	0	0	0	100
75	4,354	30	30	70
35	5,080	35	65	35
15	3,629	25	90	10
<15	1,451	10	100	-

TOTAL 14,514 kg

NOTE: Largest stone 114 kg

-- End of Section --

STONE SOURCES

LAT/LONG (TESTED)	QUARRY LOCATION, ADDRESS AND TELEPHONE NUMBER	MAIN OFFICE ADDRESS AND TELEPHONE NUMBER
<u>ALABAMA</u>		
34/88 (1995)	Allsboro Quarry is located 8 miles east of intersection of MS Hwy 25 and Tishomingo County Rd 957 at Midway, MS, just across AL state line.	Hoover Incorporated 1205 Bridgestone Parkway P.O. Box 17000 LaVergne, TN 37086-17000 (615) 793-2600
	Hoover Incorporated P.O. Box 613 Iuka, MS 38852 (205) 360-2400	
34/87 (1995)	Cherokee Quarry is located 3 miles east of Cherokee, AL on old Hwy 72.	Vulcan Materials Co. P.O. Box 459 Cherokee, AL 35616 (205) 359-6404
<u>ARKANSAS</u>		
34/92 (1997)	Granite Mountain Quarry #1 is located on east side of Hwy 65 and just north of Dixie Road	McGeorge Corporation P.O. Box 138 Sweet Home, AR 72164 (501) 490-1535
36/91 (1995)	Valley Stone Quarry is located 4.5 miles northwest of Black Rock, AR off U.S. Hwy 63	Meridian Aggregates Co. P.O. Box 260 Black Rock, AR 72415 (870) 878-6201
34/95 (1996)	River Mountain Quarry is located approx. 5 miles northwest of Delaware, AR, at AR River Mile 218.5.	Pine Bluff Sand and Gravel P.O. Box 7008 Pine Bluff, AR 71611-7008 (870) 534-7120
<u>KENTUCKY</u>		
37/87 (1996)	Cedar Bluff Quarry is located 3 miles south of Princeton, KY on KY. Hwy 91.	The Kentucky Stone Co. P.O. Box 7529 Louisville, KY 40207 (502) 897-1731
	The Kentucky Stone Co. 10234 Hopkinsville Rd. Princeton, KY 42445 (502) 365-6881	
37/88 (1996)	Three Rivers Quarry is located 7 miles northeast of Smithland, KY, off Hwy 60 (Cumberland Road)	Martin Marietta Aggregates 830 Three Rivers Quarry Rd. Smithland, KY 42081 (502) 928-2141

STONE SOURCES

(Continued)

LAT/LONG (TESTED)	QUARRY LOCATION, ADDRESS AND TELEPHONE NUMBER	MAIN OFFICE ADDRESS AND TELEPHONE NUMBER
37/88 (1996)	Gilbertsville Quarry is located on U.S. Hwy 62 "Between the Dams" Lake City, KY.	Vulcan Materials Co. Reed/BRT Operations 947 U.S. Hwy. 62 Grand Rivers, KY 42045 (502) 362-4265

MISSOURI

37/89 (1995)	Gray's Point Quarry is located at MRM 46.2, above the mouth of the Ohio River. Tower Rock Stone Co. P.O. Box 4248 Scott City, MO 63780 (573) 264-3800	Tower Rock Stone Co. P.O. Box 50 Columbia, IL 62236 (618) 281-4106
38/90 (1995)	Bussen Quarry is located 5 miles north of St. Genevieve, MO, MRM 127.6, above the mouth of the Ohio River. Tower Rock Stone Co. P.O. Box 111 St. Genevieve, MO 63670 (573) 883-7415	Tower Rock Stone Co. P.O. Box 50 Columbia, IL 62236 (618) 281-4106

G R A D A T I O N T E S T D A T A S H E E T

Quarry _____ Type of
Stone Tested _____

Date of Test _____ Testing Rate _____

T E S T R E P R E S E N T S

Contract No. _____

District _____

Tons _____

TOTAL		

G R A D A T I O N

Stone Size (lbs)	Weight Retained	Individual % Retained	Cumulative % Ret. % Pass	Specification % Finer by wt
---------------------	--------------------	--------------------------	--------------------------------	--------------------------------

Total Wt					

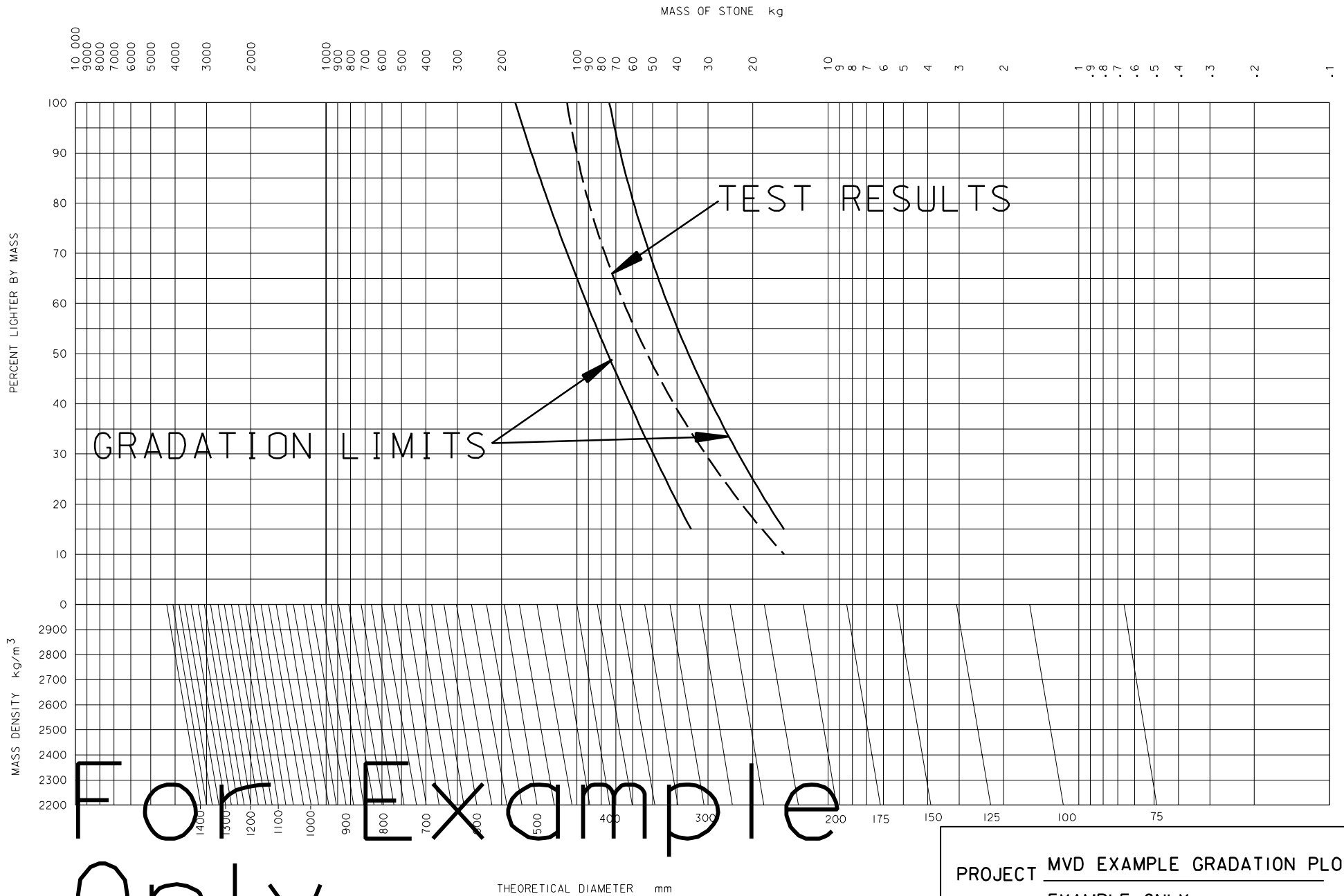
Remarks: _____

I certify that the above stone sample is representative of the total tonnage covered by this test report.

Contractor Representative _____

Government Representative _____

LMV FORM 602-R



For Example
Only

PROJECT MVD EXAMPLE GRADATION PLOT
 AREA EXAMPLE ONLY
 DATE _____ BY _____

RIPRAP GRADATION CURVES

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DIVISION 02 - SITE WORK

SECTION 02719

CORRUGATED METAL PIPE

PART 1 GENERAL

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SECTION 02719

CORRUGATED METAL PIPE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123/A 123M	(1997a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 760/A 760M	(1997) Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A 780	(1993a) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings
ASTM A 849	(1996) Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
ASTM A 929/A 929M	(1996) Sheet Steel, Metallic-Coated by the Hot-Dip Process for Corrugated Metal Pipe
ASTM D 1056	(1998) Flexible Cellular Materials - Sponge or Expanded Rubber

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(1998) Structural Welding Code - Steel
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1.2 GENERAL

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on corrugated metal pipe shall be in accordance with the applicable provisions of AWS D1.1, except that the limitations therein on types of base metal shall not apply where other types are specified or shown.

1.3 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-13 Certificates

Corrugated Steel Pipe; FIO.

Certificates of compliance attesting that the corrugated steel pipe meets specification requirements shall be submitted.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Corrugated Metal Pipe

The pipe shall be corrugated steel pipe in accordance with ASTM A 760/A 760M, aluminum coated, Type I, full circular cross-section, with helical corrugations and folded lock seams. The lock seams shall be welded at each end of the pipe section. Corrugations for 1,050 mm diameter pipe and smaller shall be 68 by 13 mm (nominal size). Corrugations for 1,200 mm pipe and larger shall be either 68 by 13 mm (nominal size) or 75 by 25 mm (nominal size). Pipe shall be fabricated from aluminum coated steel sheeting conforming to ASTM A 929/A 929M. If ASTM A 760/A 760M (metric diameters) pipe is not locally available, then (inch diameters) pipe may be furnished as specified herein.

2.1.1.1 Pipe 750 Millimeters In Diameter Or Less

Pipe 750 mm in diameter or less shall have the ends equipped with a minimum of four (4) rerolled annular corrugations when paragraph PIPE ALL SIZES connecting bands are used and a minimum of four (4) rerolled annular corrugations when paragraph PIPE 750 MILLIMETERS OR LESS connecting bands are used.

2.1.1.2 Pipe 900 Millimeters In Diameter Or Larger

Pipe 900 mm in diameter or larger shall have the ends equipped with a minimum of four (4) rerolled annular corrugations. The rerolled corrugations may be independent of the corrugation of the pipe body.

2.1.1.3 Lifting Lugs

All pipe 900 mm in diameter or larger shall be equipped with two (2) lifting lugs. These lugs shall be attached to the pipe by welding. Welding shall be done by qualified welders and in accordance with Section 05056 WELDING. All welds and exposed metal shall be prepared in accordance with paragraph TOUCH-UP.

2.1.1.4 Pipe Gage

The gage of the pipe shall be as specified below:

PIPE GAGE		
Pipe Diameter Millimeters (in.)	68 by 13 Corrugations	75 by 25 Corrugations
600 (24)	14	--
750 (30)	14	--
900 (36)	12	--
1,050 (42)	12	--
1,200 (48)	10	12
1,350 (54)	10	12
1,500 (60)	10	12
1,650 (66)	10	12

PIPE GAGE

1,800 (72)	10	12
1,950 (78)	10	12
2,250 (90)	10	12

The Contractor may elect to furnish pipe section lengths in combinations that will reduce the number of connecting bands. Pipe section lengths shall be approved. The minimum length of any pipe section shall be 4.9 meters.

2.1.1.5 Handling Pipe

Handling pipe upon delivery shall conform to paragraph INSTALLATION, subparagraph PIPE.

2.1.2 Riser

The pipe shall be as specified in paragraph CORRUGATED METAL PIPE. The gage of the pipe shall be as specified in paragraph PIPE GAGE.

2.1.2.1 Anti-vortex Baffle

The corrugated metal anti-vortex baffle shall be constructed as indicated. The anti-vortex baffle shall be 14 gage minimum thickness and shall be galvanized in accordance with ASTM A 123/A 123M coated as required for corrugated steel pipe.

2.1.2.2 Accessories

Bolts, nuts, washers, structural steel shapes and accessories shall be galvanized in accordance with ASTM A 123/A 123M.

2.1.2.3 Pipe Stub

The corrugated metal pipe stub size and gage shall meet the requirements specified for corrugated metal pipe and as shown.

2.1.3 Connecting Bands

2.1.3.1 Pipe All Sizes

Connecting bands may be used for any size pipe. They shall have a minimum of nine (9) corrugations (68 by 13 mm corrugations) or seven (7) corrugations (75 by 25 mm corrugations) and a minimum circumferential lap of 150 mm. The band shall be rolled so that when it is placed on the pipe sections, the ends of the pipe will fit flush. The binders for the connecting band shall consist of a minimum of six (6) rods and tank lugs in accordance with the details shown. A closed cell expanded rubber gasket shall be used with this type connecting band. The closed cell gasket shall be 300 mm wide, 9.5 mm thick, unstretched diameter 10 percent less than the normal pipe size and shall comply with ASTM D 1056, Grade SCE-43. The gasket shall be centered over the pipe joint under the connecting band.

2.1.3.2 Pipe 750 Millimeters Or Less

Connecting bands may be used for connecting pipe 750 mm in diameter or less. This band shall consist of one continuous corrugation on each side

to mesh with the second annular corrugation on the end of the pipe. A 19 mm O-ring gasket shall be installed in the first annular corrugation of the end of the pipe. A mastic shall be placed in the lap area of the band prior to tightening of the rods and bolts. The mastic shall be as recommended by the pipe manufacturer. A tank rod and lug shall be placed in the annular corrugation on the outside of the band in accordance with the details as shown.

2.1.3.3 Tank Rods

The tank rods shall be 12 mm in diameter and shall be equipped with 12 mm diameter rolled threads. The nuts used on the rods shall be 12 mm x 100 mm steel hexagon head coupling nuts galvanized and retapped 0.5 mm (0.8 mm maximum) oversized to remove excess galvanizing from threads. Tank rods, nuts and washers shall be galvanized in accordance with ASTM A 123/A 123M. If metric sized products are not locally available, the following may be substituted. The tank rods shall be 12 mm in diameter and shall be equipped with 12 mm x 100 mm steel hexagon head coupling nuts galvanized and retapped 0.5 mm (0.8 mm maximum) oversized to remove excess galvanizing from threads.

2.1.3.4 Bands

The bands shall have the same coating, depth of corrugation and gage as specified for the pipe.

2.1.4 Test Reports and Bills of Lading

Metallurgical test reports showing respective heat numbers and bills of lading shall be furnished for all pipe delivered to the job.

2.1.5 Bituminous Coating

The bituminous coating shall meet the requirement of ASTM A 849.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Pipe

When delivered to the jobsite, the pipe shall be unloaded from the truck in a manner that will ensure no damage to the coatings or bending of the pipe. The pipe shall be unloaded by use of hoist, skids and snubbing ropes or other methods approved. Under no circumstances shall the pipe be allowed to drop from the truck or roll freely. Lifting of the pipe shall be done by use of slings or lifting lugs attached to the pipe. The use of hooks attached to the ends of the pipe will not be allowed. Two bituminous coatings shall be applied to that part of the corrugated metal pipe which is to be in contact with the concrete and is to be applied just prior to placing of concrete.

3.1.2 Pipe Stub

The corrugated metal pipe stub shall be attached to the pipe riser by a continuous shop weld around the periphery of the pipe.

3.1.3 Connecting Bands

The connecting bands shall be installed as shown. The closed cell gasket shall be centered over the pipe joint under the connecting band.

3.1.4 Welding

Welding shall be done by qualified welders in accordance with Section 05056 WELDING.

3.1.5 Touch-up

All welds and exposed metal shall be prepared in accordance with ASTM A 780 and two coverages of bituminous coating shall be applied to the prepared surfaces.

3.2 PIPE TRENCH EXCAVATION

3.2.1 General

The pipe trench excavation shall consist of removal of material in preparing the foundation to the lines and grades shown and specified. The surfaces upon which pipe is to be placed shall be accurately finished to the lines and grades required. All foundations shall be on solid, undisturbed or properly compacted material. When disturbed by the Contractor's operations, and elsewhere as required, the excavated surfaces shall be moistened with water if necessary and tamped or rolled with suitable tools or equipment for the purpose of thoroughly compacting them and forming firm foundations upon or against which to place the pipes. Overexcavation will not be permitted except to remove unsuitable material as directed. If at any point in the excavation for pipes, material is excavated beyond the excavation lines shown, such unauthorized overexcavation shall be backfilled and compacted as specified for backfill in Section 02226 EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER, at no additional cost to the Government. If at any point in excavation the foundation material is found to be unsuitable, it shall be removed as directed and replaced with selected materials and compacted as specified above and an equitable adjustment in contract price and time will be made in accordance with Contract Clause CHANGES. All excavation and foundation preparation shall be performed in areas free of water. Where dimensions of pipe trenches are not shown, the bottom width shall be not less than 0.6 m greater than the outside span dimension of the pipe. Excavation for pipes shall fit the outside periphery of the bottom quadrant of the pipe. If required, cross-trenches shall be excavated to receive the hubs of pipe, and to prevent non-uniform load at joints.

3.2.2 Disposition of Materials

Excavated materials shall be disposed of in accordance with Section 02226 EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER.

3.3 PLACING OF PIPES

3.3.1 Corrugated Metal Pipe

The connecting bands shall lap at equal portion on each pipe section jointed and shall be drawn tight to ensure that the corrugations fit snugly and provide a satisfactory joint. The pipe shall be placed with the pipe invert coinciding with the specified grade lines. Pipe shall be handled with care so that the coating will not be damaged. Proper facilities shall be provided for lowering the pipe into the trench. Damaged areas on

connecting bands, pipes, and angles shall be repaired as specified in paragraph TOUCH-UP prior to placing backfill except that exposed metal in joints shall be coated prior to making joints.

3.4 BACKFILL FOR PIPES

Fill around the corrugated metal pipe shall be placed and compacted as specified for pipe backfill in Section 02226 EXCAVATION, FILL, BACKFILL, EMBANKMENT, AND CONTROL OF WATER.

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SECTION 02951

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SECTION 02951

REFORESTATION

PART 1 GENERAL

1.1 DESCRIPTION

The work covered by this section consists of furnishing all plant, labor, materials, equipment and transportation, and performing all operations necessary for reforestation of areas as specified and as shown.

1.2 AREAS FOR REFORESTATION

All areas within the rights-of-way, but outside the immediate limits of structure(s) and channel slopes, where existing trees have been removed or damaged by the Contractor, shall be reforested as specified, herein.

PART 2 PRODUCTS

2.1 PLANTS

All plants shall be healthy stock free of plant disease and parasites of an objectionable or damaging nature. One or both of the following species shall be used:

- a. Cherrybark Oak (*Quercus falcata* var, *pagodaefolia*)
- b. Water Oak (*Quercus nigra*)

PART 3 EXECUTION

3.1 REFORESTATION

3.1.1 Preparation

In the areas to receive reforestation, planting shall be in rows 3.6 meters apart with a spacing of 3.6 meters between trees in each row. All planting shall be done between 1 November and 15 March, inclusive, but no planting shall be done prior to deciduous plant defoliation as a result of frost. The method of planting shall be as follows:

- a. At the proper spacing within the row, pick a location free of debris (duff, leaves, litter, grass, etc.). If no acceptable spot free of debris is available, clean the debris off a planting spot by raking the debris away with the foot, planting bar, or other means acceptable and approved.
- b. Insert the entire usable blade of a planting bar straight down into the soil near the center of the planting spot and open the planting hole by pulling back and pushing forward on the bar handle (the planting bar shall be used so the blade is parallel to the planter's front side). If the hole does not open cleanly, rock the handle to and fro until a clean hole is formed.
- c. Remove the planting bar from the planting hole. Remove a seedling

from the planting bag and immediately place the seedling into the planting hole. The seedling roots should be gently placed into the planting hole so that the root collar of the seedling is below the desired planting depth 25 mm to 50 mm, but not far enough to damage the seedling roots. The seedling should then be pulled gently upward until the desired planting depth is reached. The desired planting depth is at or not more than 25 mm deeper than grown at the nursery.

d. Secure the seedling in place at the proper planting depth with soil. This is done by using the planting bar to slough off the near side of the planting hole while the seedling is being held in place at the proper depth with the hand or by some other method approved. To slough off the near side of the hole, the planting bar is inserted, 25 mm to 50 mm behind the planting hole and the handle is pushed forward causing the soil to move forward closing the planting slit and holding the seedling temporarily in place.

e. Make the closing hole by inserting the entire usable bar blade straight down into the soil approximately 50mm - 100 mm behind, and parallel to, the planting hole.

f. To close the bottom of the planting hole pull back firmly on the bar handles. This packs the soil against the seedling roots at the bottom of the planting hole. Next, push bar handle forward to firmly pack the soil against the entire portion of seedling in the ground and to prevent any air pockets from forming around the roots. If necessary, to remove the bar from the ground leaving a clean closing hole, the bar may be rocked to and fro prior to withdrawal.

g. Fill in the closing hole by firming (stamping) with the heel or by other methods approved. Do not step on the seedling or cause the seedling to lean. Check for tightness by pulling on the tip of the seedling.

3.1.2 Seedlings

Tree seedlings shall be a minimum of 355 mm in height. See paragraph PLANTS.

3.1.2.1 Care of Seedlings

a. Weather Conditions

Seedlings may be planted at any time when weather conditions are determined to be satisfactory and approval given. Frozen ground, temperature above 29 degrees C, relative humidity below 30 percent, wind velocity 24 km/h or above, or available soil moisture less than 50 percent are unsatisfactory planting conditions.

b. Protect The Seedlings

The Contractor shall protect the seedlings and take precaution to prevent damage to them from time received by the Contractor until they are planted. This shall include, but is not limited to:

(1) Bags and bales shall not have prolonged exposure to direct sunlight.

(2) Water roots of seedlings in bags and bundles if roots begin

to dry. Do not puddle water in bags as excess water can drown root tips and promote mold in the seedlings.

(3) Keep bags tightly closed by folding down top and laying flat side down or by placing a band or cord firmly around the bag.

3.1.2.2 Handling of Seedlings

a. Removal of Seedlings

Remove only one handful of seedlings at a time from the bag or bale. Separate and untangle this handful and immediately place it in planting bag. Separate and untangle only enough seedlings to fill planting bag to be carried with the planters (2 hours supply maximum). Do not separate and untangle an entire bale or bundle or an advance quantity of seedlings. Feeder roots may be pruned to approximately 50 mm prior to planting.

b. Protect seedlings from damage

Do not crush, stand or sit on seedlings. Do not abuse the seedlings by hitting the roots or striking the roots across an object to remove excess soil.

c. Warming Fire

Do not build a warming fire within 30 meters of area where seedlings are being handled.

d. Elements

Do not allow seedlings to be exposed to the elements more than two (2) minutes. Additional exposure time will not be allowed for counting seedlings.

e. Removal From Planting Bag

Only one seedling at a time shall be removed from the planting bag. This should be done after the planting hole or slit has been made in the ground.

3.2 INSPECTION AND ACCEPTANCE

3.2.1 Planted Seedlings

Planted seedlings shall be inspected to insure the following standards are met:

- a. Planting hole free of trash.
- b. Only one seedling per hole.
- c. Seedlings are not damaged by planting.
- d. Seedlings are within 20 degrees of vertical.
- e. Seedlings are planted at the depth they were grown in the nursery or up to 25 mm deeper.

f. Seedlings are planted without "U" roots, "L" roots, or twisted or balled roots.

g. Seedlings are planted so that they are visibly tight, are not loose in the ground and can withstand being pulled from the ground by the terminal bud.

3.2.2 Acceptance

Acceptance of reforestation will be made as a whole for the completed work and will be based on the Contracting Officer's visual inspection. Dead or dying trees will not be accepted and shall be replaced at no additional cost to the Government.

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SECTION 02960

EROSION CONTROL

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Fertilizer; FIO.

The Contractor shall submit signed copies of invoices from suppliers which show quantities and the percentages of nitrogen, phosphorous, and potash.

1.2 AREAS TO RECEIVE EROSION CONTROL

All disturbed areas within the right-of-way limits, including the portion of the fill that receives lime treatment, except areas to receive other types of surfacing, shall receive erosion control as specified.

PART 2 PRODUCTS

2.1 FERTILIZER

Fertilizer shall meet the requirements of the State of Mississippi for commercial fertilizer. Fertilizer shall have a minimum analysis of 13 percent nitrogen, 13 percent phosphorus, and 13 percent potash (13-13-13). Duplicate signed copies of invoices from suppliers shall be furnished to the Contracting Officer upon delivery to the worksite. Invoices shall show quantities and percentages of nitrogen, phosphorus, and potash.

2.2 SEED

Grass seeds shall be labeled in accordance with the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of purchase. The seed shall have a minimum purity of 90 percent and a minimum germination rate of 80 percent. Seeding mixtures per each hectare seeded shall be in accordance with the following:

2.2.1 Spring and Summer Seeding

If seeding is done during the period of 1 March through 30 September, the seeding mixture shall consist of a uniform mixture of 11 kg of Bahia and 11 kg of Bermuda Grass (hulled) seed per hectare.

2.2.2 Fall and Winter Seeding

If seeding is done during the period of 1 October through 28 February, the seeding mixture shall consist of a uniform mixture of 22 kg of Rye and 11 kg of Bermuda Grass (unhulled) seed per hectare.

2.3 MULCH

The mulch shall be a vegetative mulch consisting of grain straw (oats, wheat, or rice) or grass hay.

PART 3 EXECUTION

3.1 EROSION CONTROL

3.1.1 Dressing

The areas to receive erosion control shall be dressed by the cutting off of high points and the filling of depressions to the extent necessary to provide a reasonably smooth surface that can be readily traveled by a farm tractor pulling a rotary type mower.

3.1.2 Application

After dressing, the areas to receive erosion control shall be fertilized and seeded. In areas that have not received lime treatment, fertilizer shall be uniformly distributed at a rate of 225 kg per hectare over areas to be seeded and shall be incorporated into the soil to a depth of at least 100 mm by disking, harrowing, or other acceptable methods. In areas that have received lime treatment, fertilizer shall be uniformly distributed over the entire surface at a rate of 225 kg per hectare and lightly harrowed no deeper than 25 mm. After dressing has been completed and fertilizer incorporated, surfaces shall be seeded by uniformly distributing the applicable mixture of grass seed specified in paragraph SEED per each hectare. After the seed has been distributed, the entire finished surface shall be compacted by two passes of a conventional tractor-drawn cultipacker.

3.2 MULCHING

Mulching shall be performed within 24 hours after seeding. Mulch shall be applied uniformly on the soil surface at the rate of 3.4 metric tons per hectare. The mulch shall be anchored into the soil with a mulch crimper. The mulch crimping equipment shall have straight, notched, dull blades no more than 255 mm apart and shall be equipped with scrapers. The mulching material shall be anchored at least 25 mm into the soil. Anchoring the mulch shall be performed along the contour of the ground surface. The mulch shall be applied by means of approved equipment suitable for such work.

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DIVISION 02 - SITE WORK

SECTION 02961

LIME TREATMENT

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SECTION 02961

LIME TREATMENT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 977	(1995) Quicklime and Hydrated Lime for Soil Stabilization
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1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-13 Certificates

Hydrated Lime; FIO.

The Contractor shall submit a statement signed by responsible official of the manufacturer of the hydrated lime attesting that the material meets specified requirements. The statement must be dated after the award of this contract, must name the project, and must list the specific requirements which are being certified.

PART 2 PRODUCTS

2.1 Hydrated Lime

Hydrated lime shall meet the requirements of ASTM C 977.

PART 3 EXECUTION

3.1 SPREADING AND MIXING LIME

3.1.1 Spreading

The area to be treated with lime shall be as shown on the drawings. The depth of lime treatment shall be a minimum of 150 mm. The processing area for mixing and curing the lime and soil shall be located within the borrow area or at the Contractor's option, lime may be mixed in place. Lime shall be applied to the soil being treated at the rate of 3 percent of lime by weight based on a dry unit weight of soil of 1280 kilograms per cubic meter. Where mixed in place to a depth of 150 mm, 5.76 kilograms of lime is required per square meter of surface.

3.1.2 Mixing

After application of lime a liberal amount of water shall be applied over the surface to prevent dusting and achieve good distribution of the lime. Care shall be taken not to displace the lime on sloped surfaces. Water shall be added even if the moisture content is above the optimum moisture content for compaction. Mixing of the lime with the soil shall be accomplished with disks (level easily accessible surfaces only) or a high speed rotary pulverizer (required when mixing in place on slopes). The soil-lime mixture shall be mixed until 100 percent passes the 25 mm sieve and 60 percent passes the 4.75 mm sieve. After initial mixing, the lime treated layer shall be sealed to minimize evaporation loss, lime carbonation and excessive wetting from rainfall. Sealing may be accomplished by lightly compacting the surface of the treated layer with a pneumatic tire or smooth wheel roller or by a single coverage by dozer tracks if mixed in place. The initial mixture of lime, soil and water shall be completed in the same workday it is started. The size of the daily work area shall be restricted to assure this is accomplished.

3.2 Curing and Remixing

The lime and soil mixture shall be cured a minimum of 24 hours unless otherwise specified. Should the Contractor choose to prepare the lime-soil mixture within the borrow area, the mixture shall be thoroughly remixed after the required curing time and prior to placement on the embankment. Where the lime was initially mixed in place, it shall be remixed following a minimum 24 hour curing period.

3.3 Placement

(If Lime-Soil Mixture Not Mixed In Place)

Placement of the lime-soil mixture shall not begin prior to the completion of the specified curing period. Immediately before placement of the lime-soil mixture, the sub-grade shall be scarified and watered to assure that the moisture content is comparable to that of the lime-soil mixture. Placement of the lime-treated material on the designated areas shall be accomplished in one lift. The depth of the layer before compaction shall be enough to produce a compacted layer approximately 150 mm in thickness.

3.4 Compaction

The lime-soil mixture shall be compacted at its existing moisture content. Compaction shall be as specified in Section 02226 paragraph COMPACTION, subparagraph FILL AND EMBANKMENT.

3.5 Top Soil

The Contractor shall place 150 mm of top soil over lime treated areas.

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DIVISION 05 - METALS

SECTION 05056

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SECTION 05056

WELDING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 780 (1993a) Repair of Damaged and Uncoated
Areas of Hot-Dipped Galvanized Coatings

ASME INTERNATIONAL (ASME)

ASME BPV IX (1998) Boiler and Pressure Vessel Code;
Section IX, Welding and Brazing
Qualifications

AMERICAN WELDING SOCIETY (AWS)

AWS A5.1 (1991) Carbon Steel Electrodes for
Shielded Metal Arc Welding

AWS A5.5 (1996) Low Alloy Steel Covered Arc Welding
Electrodes

AWS D1.1 (1998) Structural Welding Code - Steel

CODE OF FEDERAL REGULATIONS (CFR)

46 CFR 57 Welding and Brazing

1.2 QUALIFICATIONS

Welding operators and welders, including tack welders, shall be qualified and, as necessary, re-qualified for the particular type of work to be done. Qualifications shall be in accordance with one of the following codes:

- a. ASME BPV IX;
- b. AWS D1.1, Section 5; or
- c. The Contractor may qualify his welding operations and welders pursuant to 46 CFR 57.

The Contractor shall certify by name, to the Contracting Officer, the welders and welding operators so qualified including the code and procedures under which qualified. Prior qualification may be accepted provided the welder has performed satisfactory work under the code for which qualified within the preceding 3 months. The Contracting Officer may require the Contractor to have any welder or welding operator to repeat the

qualifying tests when his work indicates a reasonable doubt as to his proficiency. In such case, he shall be recertified, as above, if he successfully passes the retest, otherwise, he shall be disqualified until he successfully passes a retest. All expenses in connection with qualification and re-qualification shall be borne by the Contractor.

PART 2 PRODUCTS

2.1 FILLER METAL

All filler metal for welding structural steel shall conform to AWS D1.1, except that only low-hydrogen electrodes shall be used for manual shielded metal-arc welding regardless of the thickness of the steel.

2.2 WELDING ELECTRODES

Welding electrodes shall conform to AWS A5.1, or AWS A5.5, Class E 70XX.

PART 3 EXECUTION

3.1 WELDING

All welding done under this contract shall be by an electric arc welding process, using a method which excludes the atmosphere from the molten metal. Welding shall conform to the applicable provisions of the AWS D1.1, except that the limitations therein on types of base metal shall not apply where other types are specified or shown.

3.2 SPECIAL WORKMANSHIP REQUIREMENTS

3.2.1 Preheating

Preheating shall be performed where specified or otherwise required. The weldments to be preheated shall be slowly and uniformly heated by approved means to a minimum of 49 degrees C and held at that temperature until the welding is completed and then permitted to cool slowly in still air.

3.2.2 Temporary Welds

Temporary welds required for fabrication and erection shall be made under the controlled conditions prescribed for permanent work. All temporary welds shall be made using low-hydrogen welding electrodes by welders qualified for permanent work as specified elsewhere in these specifications. Preheat furnished for temporary welds shall be as required by AWS D1.1 for permanent welds except that the minimum shall be 49 degrees C in any case. In making temporary welds, arcs shall not be struck in other than weld locations. Each temporary weld shall be removed after serving its purpose and ground flush with adjacent surfaces.

3.2.3 Tack Welds

Tack welds that are to be incorporated into the permanent work shall be subject to the same quality requirements as the permanent welds. Preheating shall be performed as specified for temporary welds above. Such tack welds shall be thoroughly cleaned and made flush with the permanent welds. Multiple-pass tack welds shall have cascaded ends. Defective tack welds shall be removed before permanent welding.

3.3 INSPECTION BY GOVERNMENT

3.3.1 General

Welding shall be subject to inspection by Government inspectors to determine conformance with the requirements of AWS D1.1 and approved welding procedures and provisions stated elsewhere in these specifications. The Contracting Officer may require coupons to be cut from any location in any joint. See also the Contract Clause INSPECTION OF CONSTRUCTION.

3.3.2 Test Coupons

When testing, should any two test coupons cut from the work of any welder show strengths under test less than that specified for the base metal, it will be considered evidence of negligence or incompetence, and such welder shall be permanently removed from the work. When test coupons are removed from any part of a structure, the members cut shall be repaired in a neat workmanlike manner with joints of proper type to develop the full strength of the members, with peening as approved or directed to relieve residual stress. The expense for removal and testing of the coupons and repair of the cut members shall be assigned to the Government or the Contractor in accordance with Contract Clause INSPECTION OF CONSTRUCTION.

3.3.3 Visual Examination

Prior to any welding, the Contractor shall visually inspect the preparation of material for welding to assure compliance with Section 3.2 of AWS D1.1. Welds shall be examined carefully by the Contractor for insufficient throat or leg sizes, cracks, undercutting, overlap, excessive convexity or reinforcement, and other surface defects. Defects shall be corrected as provided in paragraph REPAIRS.

3.3.4 Nondestructive Examination by Government

The Government reserves the right to perform supplemental nondestructive examinations as deemed necessary to detect cracking or similar defects that might occur during shipment or erection and before final acceptance by the Government. The cost of such inspection, repairs and re-examination will be borne by the Government or Contractor in accordance with Contract Clause INSPECTION OF CONSTRUCTION.

3.4 REPAIRS

Defective weld metal shall be removed by flame or arc gouging to sound metal. Remove all carbon by grinding. The resulting cavities shall be re-welded in compliance with Section 6.6 of AWS D1.1. Repairs for welds shall be performed in accordance with ASTM A 780. When deemed necessary by the Contracting Officer, the Contractor shall prepare a welding repair plan before repairs are made. Welds that have been repaired shall be retested by the same methods as those used in the original inspection. All costs of repairs and retesting shall be borne by the Government or Contractor in accordance with Contract Clause INSPECTION OF CONSTRUCTION.

-- End of Section --